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Ocean News & Technology

June 2011

The Challenges for Wave & Tidal Power

Worldwide Ocean Observatory Activities: 2011 Update

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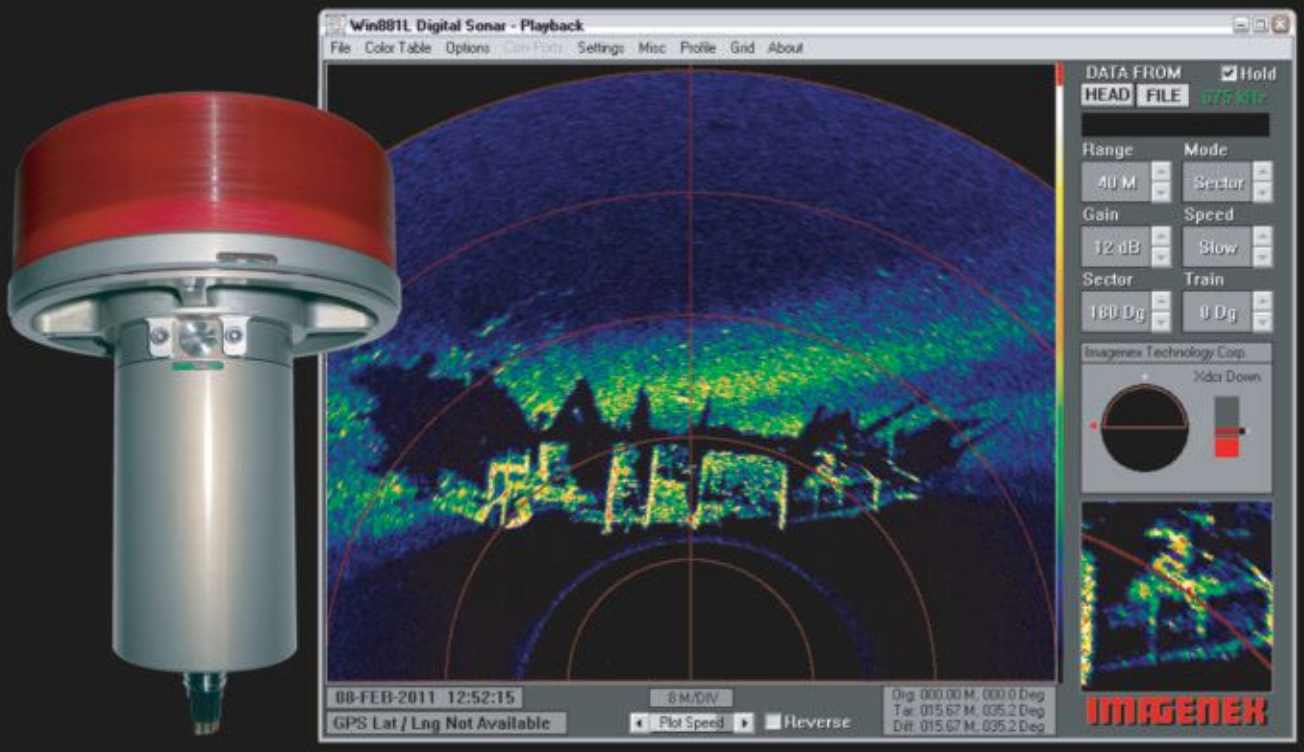

Sonar image of the Minesweeper shipwreck, *VT-100*

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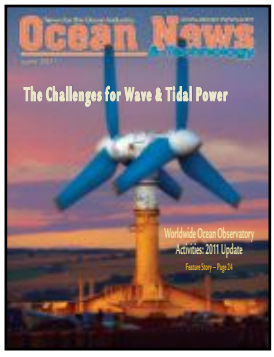

Cover Photo
Atlantis Resources Corporation's tidal current turbine - AK1000™ currently installed and producing electricity at EMEC

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Editorial

By Ray Tyson

Ocean News & Technology

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Obama's energy plan long on politics but short on details

President Obama's surprise energy initiative, calling in part for additional oil and gas lease sales and the extension of offshore leases caught up in the President's own drilling moratorium following the Deepwater Horizon tragedy, is positive and obviously would be welcomed by industry. Unfortunately, like many of Obama energy initiatives, it was utterly lacking in detail when the President announced the plan during his weekly radio and Internet address on May 14.

It also appears that very little original thinking went into the Obama plan, which seems highly political in nature and more of an attempt to respond to critics who believe the Obama administration isn't doing enough to increase U.S. oil production and curtail rising gasoline prices. To affect real change, all the President had to do was acknowledge and support many of his key elements found in existing legislation already in deep play.

For example, last month the House passed a trio of bills that would mandate a major expansion of offshore drilling and set firm deadlines for the Interior Department to act on offshore drilling permit requests. Moreover, a bipartisan group of U.S. senators, led by Sen. Kay Bailey Hutchison (R-Texas), introduced legislation to extend offshore drilling leases by one year.

The senior House Republican leading the charge for a major expansion of offshore oil drilling alleged that President Obama's new plan for speeding up development was far too modest.

"One weekend address announcing minor policy tinkering, while positive, does not erase the administration's long job-destroying record of locking-up America's energy resources," charged Doc Hastings (R-Wash.), the chairman of the House Natural Resources Committee, in a statement.

Hastings called the House bills "real action to produce real American energy." But, he said that Obama is starting to come around to the GOP's views. "It's ironic that while the White House and Congressional Democrats strongly criticized these efforts, President Obama is now taking tiny baby steps in our direction."

President Obama used his weekly address to tout steps aimed at accelerating oil drilling, including as a task force to expedite permitting for projects off Alaska's coast; annual lease sales in Alaska's National Petroleum Reserve; and extension of leases in the Gulf of Mexico and off Alaska's coast that were affected by restrictions imposed after the BP oil spill.

However, in what has all the making of an unfolding bureaucratic delay, U.S. offshore drilling regulators are said to be working to determine how to grant lease extensions to oil and gas companies whose drilling projects were affected by the oil spill. This process alone, with all of its required public hearings, could take months or even years to complete.

National Petroleum Reserve-Alaska

Moreover, it appears the U.S. Interior Department, the agency most responsible for managing America's natural resources, missed Obama's speech and continues to pursue policies that would give Big Brother more unnecessary and even harmful control over oil and gas companies.

Less than a week after Obama outlined his plan, Interior Secretary Ken Salazar delivered his wish list to the Senate Energy and Natural Resources Committee, in part asking for the authority to impose fees on companies with non-producing oil and gas leases, part of an effort by the administration and Democrats to impose so-called "use it or lose it" standards on leases.

Salazar and BOEMRE Director Michael Bromwich blasted a provision in a bill that would require the Interior Department to make a decision on permit applications within 30 days, with two 15-day extensions. If the Interior does not make a decision within 60 days, the permit application would be considered approved. Salazar said the provision would "pull out the rug from what it is we're trying to do here." And Bromwich called the measure "a profoundly bad idea."

But, this kind of rhetoric seems to undermine the president's new plan to speed up drilling and produce more oil.

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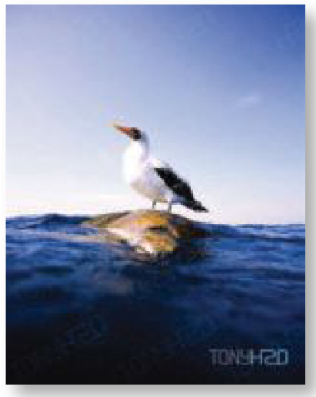

A peaceful addition to your home or office, this Tony Ludvico print is available in 25", 35" & 45"- Printed on Canvas and Gallery Wrapped.
Keyword: Resting Stop

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Keyword: iPad Case

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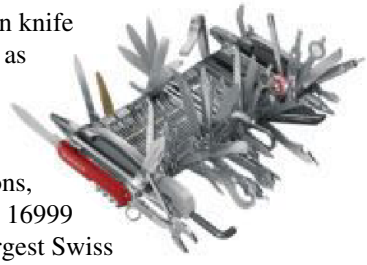

This unique special edition knife is recognized by Guinness as the "most multifunctional penknife" in the world. With 87 implements and 141 different functions, the Wenger Giant Elite 16999 is the World's Largest Swiss Army Knife. At over 2 lbs, it won't win awards as the lightest (although it does have a key ring so you can carry it on a belt loop), but it probably will win you the title of "King of All Gadgets".
Keyword: 16999

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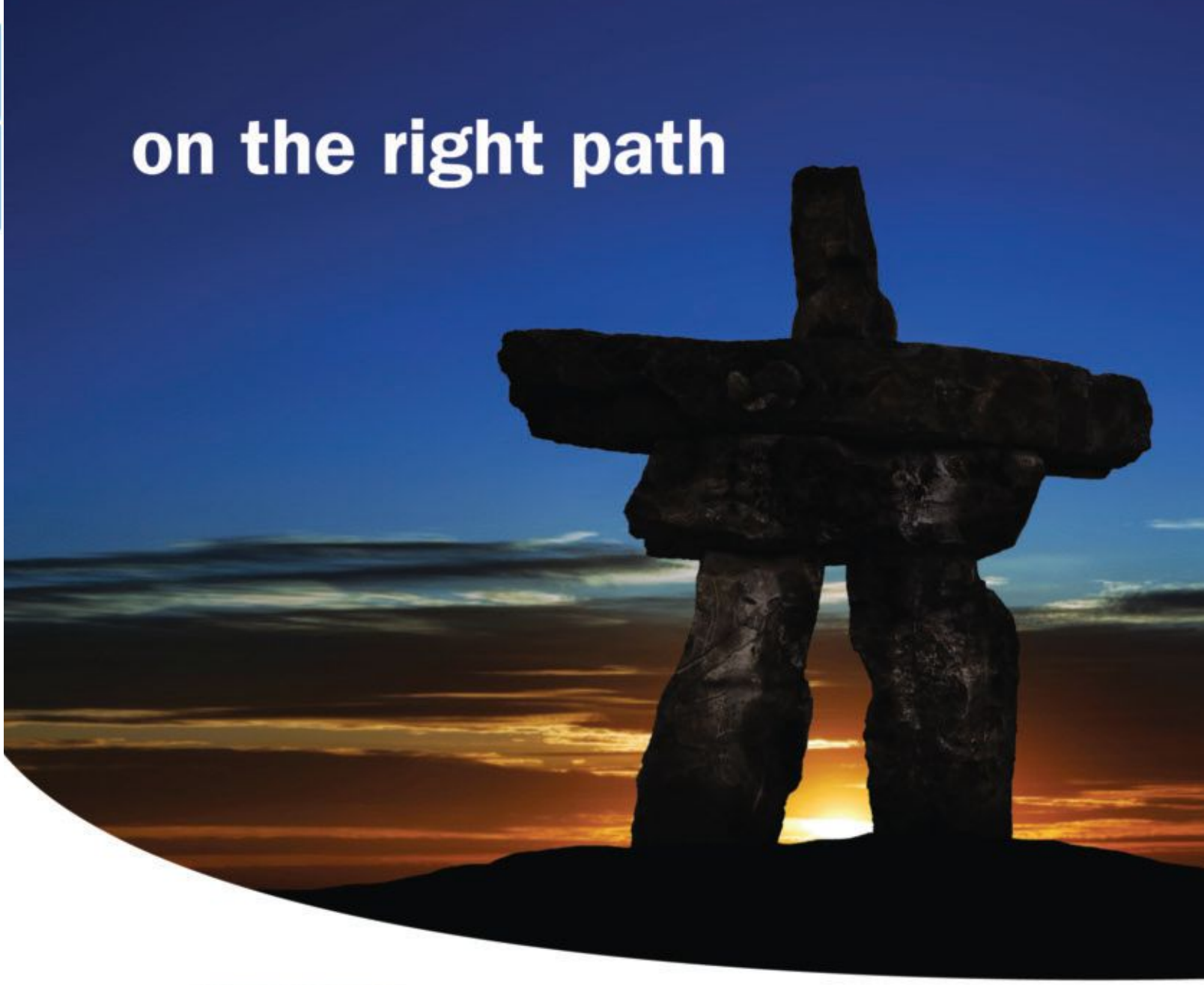

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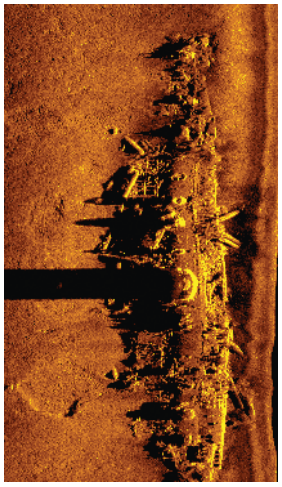
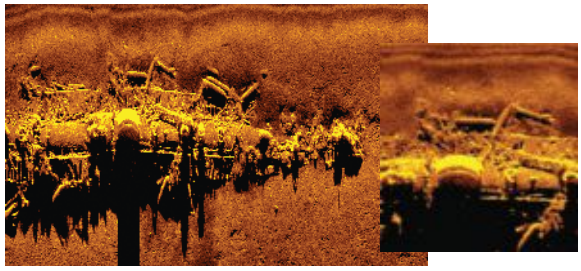
Hydroid REMUS aids in discovery of missing German U-boat





Hydroid, Inc., a subsidiary of Kongsberg Maritime, the leading manufacturer of Autonomous Underwater Vehicles (AUVs), announced that its REMUS 100 AUV aided in the discovery of the World War I German submarine U-106, which had been missing since October 1917. The Royal Netherlands Navy (RNLN), which used the REMUS vehicle, located the missing submarine off the coast of Terschelling in the Netherlands.

"The REMUS 100's compact size and proven reliability for deployment in shallow waters made it an ideal tool for this mission," said Christopher von Alt, President and one of the co-founders of Hydroid. "It was designed for operation in coastal environments up to 100 meters in depth, and it has a proven track record for durability and dependability."

In October 2009, the RNLN hydrographic survey vessel HNLMS Snellius located an unidentified object while charting shipping lanes. This was followed two months later by an inspection by an MCMV, the HNLMS Maassluis. A wire-guided Remotely Operated Vehicle (ROV) designed to locate mines, detected the shape of the vessel. The discovery prompted a series of research missions, which employed Hydroid's REMUS 100 as well as divers from the Royal Netherlands Navy's Diving and Explosive Ordnance Disposal Group (EOD).

The REMUS vehicle and the EOD divers descended 40 meters in order to explore the area, where a brass plate bearing the serial number of the submarine was eventually discovered. After further exploration as well as confirmation from the German Ministry of Defense and the families of crew members, the submarine was positively identified as the German U-106, which perished during the First World War.

"These findings always happen by chance," said expedition leader Captain-lieutenant Jouke Spoelstra. "Twelve years ago, a hydrographic survey ship passed the same spot of our discovery, but the German vessel must have still been under a layer of sand. We were lucky to be at the right place at the right time."

The German SM U-106 was one of the 329 submarines serving in the Imperial German Navy in World War I. It was commissioned on 28 July 1917 under the command of Captain-Lieutenant Hans Hufnagel. The SM U-106 is noted for sinking the HMS Contest during the First Battle of the Atlantic on 18 September 1917, and also for damaging the "City of Lincoln" a 5,867 ton steamer. The U-106 was lost off of the coast of Terschelling after striking a mine on October 7, 1917.

"The ship left behind is an official war grave," added Spoelstra. "A memorial ceremony may take place at sea, but will only occur at the initiative of the relatives."

"We are very pleased that Hydroid's REMUS vehicle was able to play a role in this remarkable discovery. We wish to thank the divers and AUV operators with the Explosive Ordnance Disposal Group who succeeded in this mission," said Graham Lester, Director of Hydroid Europe.

ABS establishes China Offshore Technology Center

ABS, the leading provider of classification services to the global offshore industry, announced the establishment of the ABS China Offshore Technology Center (COTC) in partnership with Shanghai's Jiaotong University (SJTU). The focus of the center will be on new technology research for offshore facilities. While the research efforts will support development activities in the Greater China region, applied research will also be conducted on a wide range of oil and gas development issues. Heading up the COTC will be George Wang, ABS Manager, Advanced Analysis Department, Shanghai. Wang and his team will be located within the ABS Shanghai office and plans are already underway for expansion of the COTC.

Renewables could provide almost 80% of Global Energy by 2050: UN report

Renewable energy from sources such as the SunCatcher solar dish/Stirling systems could provide the bulk of the world's energy by 2050, according to a U.N. report. Nearly 80% of the global energy supply could be met by renewables by 2050 if backed by the correct public policies, a new United Nations report shows. The Intergovernmental Panel on Climate Change (IPCC) report, released on 9 May indicates that the rising adoption of renewable energies could lead to cumulative greenhouse gas savings equivalent to 220 to 560 gigatonnes of carbon dioxide between 2010 and 2050. The upper end of the scenarios assessed, representing a cut of around a third in greenhouse gas emissions from business-as-usual projections, could assist in keeping concentrations of greenhouse gases at 450 parts per million. The report's findings are contained in a summary of the "Special Report on Renewable Energy Sources and Climate Change Mitigation." The summary is a short version of a roughly thousand-page comprehensive assessment compiled by more than 120 leading experts from all over the world for the IPCC. The report noted that the substantial increase of renewables is very challenging technically and politically. The six renewable energy technologies reviewed included bioenergy, solar power, geothermal power, hydropower, ocean energy, and wind energy. More than 160 existing scientific scenarios on the possible use of renewables by 2050 were reviewed.

Air France Flight 447 black boxes located and recovered

Phoenix International Holdings, Inc. (Phoenix) of Largo, Maryland successfully located and recovered both black boxes from Air France Flight 447. The recoveries took place in 3,900 meters of water (msw) and were made possible using the Phoenix designed and operated ROV, Remora.

Phoenix specializes in deep water operations, and its Remora ROVs are specifically designed to work in water depths down to 6,000 msw; a rare capability for a commercial company. The recoveries were completed in a very short period of time given the technical complexities of operating in extreme water depths. Remora located the Flight Data Recorder (FDR) within 12 hours on its first dive on 27 April. Unfortunately, the critical Memory Unit had separated from the chassis of the FDR. An intensive and methodical visual survey of the seafloor was then initiated in search of the proverbial needle in the haystack. With Remora operating around the clock, the Memory Unit was ultimately found at 0600 EDT on 1 May and brought to the surface. Remora returned to the debris field to commence the search for the Cockpit Voice Recorder (CVR), which records supplemental information critical to the investigation into the cause of the crash. At 1750 EDT on 2 May, the intact CVR was located and brought to deck of Ile de Sein, the Alcatel-Lucent cable ship supporting the recovery project. Both boxes will be returned to France for analysis. In the interim, Remora will continue to survey the debris field and recover items of interest as directed by the French Bureau d'Enquetes et d'Analyses (BEA) and the on-site investigative team.

Phoenix has a substantial history of performing deep water search and recoveries for the commercial airline industry. Past recovery projects have included Yemenia Flight IY626 (also conducted for BEA), Adam Air Flight 574, and Tuninter Airline Flight 1153. The company also provides search and recovery expertise to other publicly owned and private entities, the U.S. Navy, national and international agencies, and foreign governments. Phoenix is in its eleventh year

as prime contractor to the U.S. Navy for undersea search and recovery operations.

Phoenix provides manned and unmanned underwater operations, design engineering, and project management services to clients in the offshore oil & gas, defense, and other ocean-interest industries worldwide. Expertise is available from six regional offices in the areas of wet and dry hyperbaric welding, conventional and atmospheric diving, robotic systems, and tooling. Its capabilities support plug and abandonment; underwater inspection, maintenance, and repair; construction; deep ocean search and recovery; and submarine rescue.

For further information, visit www.phnx-international.com.

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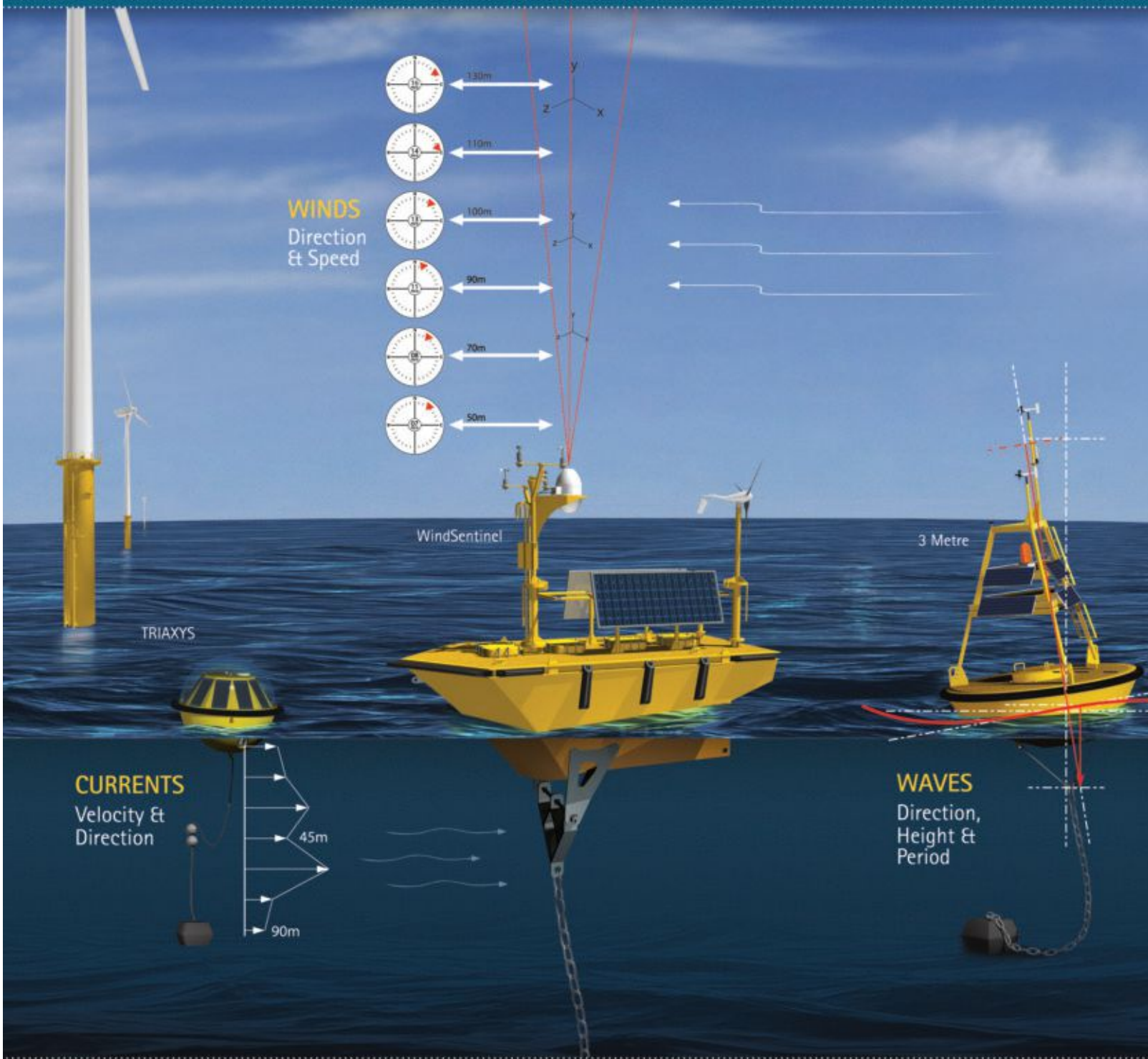

Complete Data Sets: Above, Below, and at Water Level

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Simulator facility to feature new simulator suite

Kongsberg Maritime has been selected to supply eight bridge Polaris Ship's Bridge Simulators to Vlaamse Dienst Voor Arbeidsbemiddeling en Beroepsopleiding (VDAB) in Zeebrugge, Belgium. As the public employment service of Flanders in Belgium, VDAB has chosen Kongsberg Maritime's Polaris simulator as the basis for the training and evaluation of crew for several customers, including Jan De Nul and DEME, two of the world's major dredging shipping companies. The Polaris Ship's Bridge Simulator (SBS) will allow students at VDAB's upgraded facility to train in a large number of sailing areas and is capable of providing training within a broad range of disciplines, including standard navigation, maneuvering and ship handling operations, search and rescue operations and ice navigation. The simulator meets and exceeds all STCW requirements and is designed for straightforward system expansion in order to meet new training requirements. The delivery, which is due to take place in August, comprises two Polaris DNV B bridges with 225 degree Horizontal Field of View visual system and six Polaris Special Task stations, each equipped with a 30 degree visual system. The installation will also include an instructor station and a secondary instructor/debriefing station. The full mission simulator consoles will be delivered in solid steel in order to contribute to a more realistic simulation, where students will better associate their training with real-life vessels.

Rivers Institute announces steamboat celebration

2011 marks the bicentennial of an event that changed the course of history in North America and the world. In 1811, Nicholas Roosevelt did what many thought impossible; he successfully guided a steamboat up and down the Ohio River and eventually to New Orleans, a major feat for the time. The weekend of 14 to 16 October 2011, the "Steamboat Celebration in Madison, Indiana" will be held. Several organizations are working together to make this weekend one of the Steamboat Celebration highlights of the year. The Rivers Institute at Hanover College and the Belles of Louisville and Cincinnati are proud to partner in an event that will educate and celebrate this turning point in history. The public from the Madison, Louisville, and Cincinnati and beyond are invited to any or all of the cruises offered. Both Belles will travel from their home states (with passengers) on Friday.

Unique new solution leads extensive delivery for new offshore construction vessel

The 130-metre long, 24-metre wide new offshore construction vessel Fugro Symphony has become the first ever to sail with Kongsberg Maritime's K-Master aft bridge workstation onboard. Built at the Bergen Group BMV yard, Fugro Symphony was delivered to its owner on 3rd May 2011 and features an extensive automation and control package, developed by Kongsberg Maritime. The K-Master aft bridge workstation consolidates the traditional five to six metre aft bridge console into a single or dual operator chair and uses touch-control technology to replace mechanical switches in bridge applications, except for in critical operations. K-Master positions the operator at the centre of a hub of information, giving him complete awareness of all situations at all times, therefore improving operational efficiency and safety. In addition to the new K-Master system, Kongsberg Maritime also supplied all the control and monitoring systems for the Fugro Symphony.

Bollinger launches USCG Sentinel cutter

Bollinger Shipyards, Inc. announced the successful launch of the first in class USCG "Sentinel" Fast Response Cutter (FRC), Bernard C. Webber, from its Lockport facility. The announcement was made by Bollinger executive vice president of new construction, Chris Bollinger, "We are pleased to announce the successful launch of the lead "Sentinel" Class Fast Response Cutter, Bernard C. Webber. This is the first of a new generation of multi-mission patrol boats for the United States Coast Guard, which will vastly improve their ability to perform their duties. The top notch men and women of the Bollinger family of employees and our partners in the Coast Guard are to be commended on the teamwork and dedication of keeping this program on schedule and on budget."

The Sentinel class cutter is 154-ft. long and capable of speeds in excess of 28 knots. The vessels will be armed with one stabilized remotely-operated 25mm chain gun and four crew-served .50-caliber machine guns. The cutters will be able to operate independently for five days at sea, accommodating a crew of 23 members. A state-of-the-market command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) system will be fully interoperable with other Coast Guard assets as well as those of the Department of Defense and the Department of Homeland Security. The cutters will also have a 40-knot rigid inflatable boat, which can be rapidly deployed using an innovative stern launching system that was first presented to the Coast Guard by Bollinger aboard the 87 foot Marine Protector Class cutters.

The Sentinel FRC design is based on the Damen Stan Patrol 4708 patrol boat, and the project expertise from the Coast Guard's highly successful 87-ft. Coastal Patrol Boat project, also built by Bollinger. The "Sentinel" class will be able to conduct missions, such as ports, waterways and coastal security, fishery patrols, drug and illegal migrant law enforcement, search and rescue, and national-defense operations.

The Bernard C. Webber will be homeported in Miami, Florida, supporting vital law enforcement and national security missions throughout the Caribbean and Gulf of Mexico.

GeoShips new multipurpose offshore vessel

Aberdeen-based SeaHold GeoShips Limited (GeoShips) has chartered its first new multi-purpose offshore vessel to support the growing offshore renewable energy market and the subsea sector.

To enable GeoShips to offer a full suite of services from the Stril Explorer and future vessels, the company has entered into agreements with both Hallin Marine UK Ltd, a leading ROV services provider, and NCS Survey, a leading survey and positioning contractor.

The contract is worth in the region of £15 to £20 million and will result in the creation of an unspecified number of new job opportunities within all three companies.

The Stril Explorer has been chartered from Mokster A/S until 31 August 2012. Agreements are in place for a fixed period of 3 years initially, with the prospect of a an additional two years subject to market conditions.

Formed in 2003, GeoShips has a strong focus on offshore renewable energy projects, while also being able to offer services in support of subsea oil and gas related projects. The company is anticipating good growth in 2011 and expects to add one more vessel to its medium-term fleet this year, to be followed by a similarly sized vessel in Q1/2012. The new agreements mean that Hallin Marine UK Ltd and NCS Survey will also provide their respective services on the two future GeoShips controlled vessels.

Kenny Macleod, GeoShips chairman, said, "We are delighted to be working with both Hallin and NCS Survey on the provision of comprehensive support services from our vessels. The Stril Explorer and our future planned vessels enable our partnership to support both the growing offshore renewable energy market and the subsea oil and gas sector worldwide, but particularly the European market."

The 76m dynamically positioned (DP2) vessel has a unique design — it boasts two ROV hangars, the main one of which dominates midships and stretches the breadth of the vessel. This gives the company the opportunity to potentially install larger subsea equipment as opposed to two standard WROVs. The other smaller hangar is designed for an observation class ROV or air diving spread. A 60- tonne swl knuckle-boom crane is fitted to the vessel, which allows a working depth of 1,500m with the option of going to 2,000m.

The vessel has multi-level working decks, resulting in over 900m^2 of workable deck areas. One and two-man berths allow the vessel to accommodate 70 personnel and there is also a helideck, gym, jacuzzi, large control rooms, conference rooms and office facilities.

Issues face the UK's offshore wind industry

Speaking at All Energy 2011, Andrew Reid, Douglas-Westwood's Managing Director, describes the prospects for the offshore wind market and outlined potential challenges for businesses looking to capitalize on the opportunity.

Putting the market in context, Reid commented, "The majority of global offshore wind installations have taken place over the last few years with the UK undoubtedly representing the key market. Growth in the UK market has benefited from a structured leasing process, generous financial incentives and strong political commitment."

However, UK Round 3 projects are on a different scale to what has gone before. Each construction phase of these mega-projects will see hundreds of multi-megawatt turbines installed in water depths of 35m or more and increasingly far from shore. Projects will require long-term charters of several highly specialized installation vessels and purpose-built port facilities to handle the increasing dimensions of modern wind turbines, foundations, and balance of plant. Reid commented, "Clearly Round 3 represents a step change in the industry and a wide range of issues will need to be resolved from securing financing to building robust supply chains and developing new strategies for operations and maintenance." On the financing issue, Reid commented, "To date, unlocking additional funding streams has proved challenging due to caution on the part of private investors; a trend exacerbated by the financial crisis."

The commercial opportunity is clearly significant, with Douglas-Westwood's forecasts predicting more than 11GW of new global capacity being added over the next five years. Reid further commented, "This opportunity is open to a range of businesses from existing players with first-mover advantage to new entrants in complementary sectors such as offshore oil & gas."

While making the opportunity clear, Reid advised that, "Businesses need to be aware of a number of specific issues in their planning from understanding the timing of future projects to developing internal knowledge of the policies and legislation, which are so important in this emerging sector."

ABS offers guidance for new generation offshore support vessels

Increased sophistication within the offshore support vessel (OSV) market has prompted leading classification society ABS to develop standalone guidance for these more specialized yet multi-functional vessels. Newly developed criteria and relevant existing rule requirements have been consolidated into the ABS Guide for Building and Classing Offshore Support Vessels.

ABS classes approximately one-third of the worldwide OSV fleet and, in the past, had reviewed these specialized vessels by following the ABS Rules for Building and Classing Steel Vessels Under 90 Meters (295 Feet) in Length. The new OSV Guide will be applicable to OSVs of all sizes, and it includes specific guidance for the various segments of the global support vessel market.

ABS engineers are reviewing plans for some of the most technically advanced OSVs being proposed. The recent specialized, multipurpose-designed vessels carry out maintenance and repairs on platforms, facilities and subsea piping, equipment, and systems. The new requirements from ABS are tailored for these new generation vessels.

The OSV Guide consists of four major sections: scope and conditions of classification, hull construction and equipment, machinery and systems, and offshore support services. Material and welding, strengthening for navigation in ice, and survey during and after construction are referenced from the ABS Rules for Building and Classing Steel Vessels. The intent is to evolve the ABS Guide for Building and Classing Offshore Support

Vessels into Rules during the society's next Rule making cycle.

Included in the OSV Guide are explanations of notations reflecting specialized capabilities such as transportation of supplies and equipment, towing and anchoring of offshore structures, fire fighting, diving, oil spill recovery, safety standby rescue, pipe laying, handling heavy surface and subsea loads, well intervention, well stimulation, well test, and wind farm support.

Austal's largest catamaran built to date, the 113m "Leonora Christina," was recently handed over to her owners, marking completion of construction of the high speed vehicle-passenger ferry at Austal's Henderson shipyard.

"Leonora Christina" was constructed for Danish company Færgen (formerly Nordic Ferry Services) and is due to depart Austal's Henderson shipyard for Denmark this week, where it will be operated by Bornholmer Færgen, a subsidiary of Færgen.

Austal was awarded the contract to build "Leonora Christina" in April 2009, following a competitive international tender process that saw Austal utilize its in-house design team and experience to develop a highly customized vessel design that met all of Færgen's requirements for the route. "Leonora Christina" has also been built to comply with stringent Danish regulations, covering environmental noise, wave-wash, and exhaust emissions as well as ergonomic working arrangements for the crew and strict fire and safety standards.

Seating for the vessel's 1,400 passengers is spread over the upper and bridge decks. Ample room and luxury fittings are evident throughout the vessel's refined, high-quality interior, which reflects contemporary Scandinavian design aesthetics.

The vessel's wheelhouse contains ergonomically designed navigation and control stations for the captain and navigator as well as a fully integrated monitoring and control system featuring Austal's Marine Link system that provides the ship's engineers with the ability to monitor and control the vessels safety, propulsion, generating, and other operationally critical systems. The wheelhouse extends across the full width of the vessel and provides the crew with maximum visibility, while fully equipped bridge wings on both the port and starboard sides enable safe docking of the vessel in the confined ports of Ronne and Ystad, especially in winter fog, snow, and other adverse conditions. A fully equipped crew mess, and multiple crew storage areas add to the comfort and functionality of the vessel.

The vessel's three vehicle decks offer a total capacity of 300 truck lane meters, or a maximum of 357 cars, which are accessible via both bow and stern ramps, ensuring efficient "drive through" loading and unloading of the vessel, thereby keeping turnaround times to a minimum. The fitting of hoistable vehicle decks provides Bornholmer Færgen with the flexibility to carry a mix of cars and freight. Lightweight structural fire protection, zoned sprinkler systems, and hydrants ensures optimal fire safety during vehicle transport.

With the ability to operate at speeds of up to 40 knots, "Leonora Christina" is powered by four MAN 20V28/33D engines, each capable of producing a maximum continuous output of 9,100kW and driving Rolls Royce KaMeWa 125 SIII waterjets.

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Ocean Science

Scripps gets $1.2M grant
Scripps Institution of Oceanography at UC San Diego will receive $1.2 million to investigate changing climate conditions that may affect energy generation and demand and to develop new climate scenarios specifically for California. Climate change will affect every sector of the California economy and the State's natural resources. It can affect the energy sector in multiple ways, ranging from increased electricity demand for cooling to reduce energy demand for home heating.

Marine lab research tracks pollutants in dolphins and beluga whales
Bottlenose dolphins and beluga whales, two marine species at or near the top of their respective food webs, accumulate more chemical pollutants in their bodies when they live and feed in waters near urbanized areas, according to scientists working at the Hollings Marine Laboratory (HML), a government-university collaboration in Charleston, South Carolina. One research team looked at the levels of persistent organic pollutants (POPs) found in male dolphins along the U.S. East and Gulf of Mexico coasts and Bermuda, while the other group examined the levels of perfluorinated compounds (PFCs) in beluga whales at two Alaskan locations. Data gathered in both studies are expected to serve as baseline measurements for future research to define the health effects and impacts of these pollutants on the two species. POPs are a large group of human-made chemicals that, as their name indicates, persist in the environment. They can spread globally through air and water; accumulate in the food chain; and may have carcinogenic, neurodevelopmental, immune, or endrocrine effects on both wildlife and humans.

The mass extinction of marine life in our oceans during prehistoric times is a warning
Professor Martin Kennedy from the University of Adelaide (School of Earth & Environmental Sciences), and Professor Thomas Wagner from Newcastle University, UK (Civil Engineering and Geosciences) have been studying "greenhouse oceans" — those that have been depleted of oxygen and are suffering increases in carbon dioxide and temperature. Using core samples drilled from the ocean bed off the coast of western Africa, the geologists studied layers of sediment from the Late Cretaceous Period (85 million years ago) across a 400,000-year timespan. They found a significant amount of organic material — marine life — buried within deoxygenated layers of the sediment. Professor Wagner says the results of their research, published in the Proceedings of the National Academy of Sciences, has relevance for our modern world: "We know that 'dead zones' are rapidly growing in size and number in seas and oceans across the globe. These are areas of water that are lacking in oxygen and are suffering from increases of CO_2, rising temperatures, nutrient run-off from agriculture, and other factors."

CSA International, Inc. establishes environmental and scientific research fleet in the Gulf of Mexico

Through its relationship with Bordelon Marine Inc., of Lockport, Louisiana, CSA International, Inc. (CSA) has developed a fully equipped fleet of offshore environmental and oceanographic survey vessels ranging from 110-ft. to 170-ft. DP. The fleet is based at CSA's Marine Base in Houma, Louisiana, which is fully staffed with logistics and technical personnel capable of mobilizing and maintaining the fleet and its extensive array of equipment.

The vessels have a wide range of capabilities, including water column profiling and current measurement; water and sediment sampling; hull- and pole-mounted acoustic profiling systems, including multi-beam sonars; deep-tow systems; deepwater and shallow ROV operations; plankton sampling systems; and wet lab and sample storage as well as a wide range of highly specialized scientific and environmental survey systems and technology.

"Our relationship with Bordelon Marine has provided CSA access to a fleet of specialized vessels that have been modified to facilitate our unique operations," stated Kevin Peterson, CEO of CSA International, Inc. "The additional living quarters, lab space, and power systems as well as the enhanced vessel handling capabilities of a DP vessel give us the flexibility to address a wide variety of offshore environmental and oceanographic survey cruise requirements in both shallow and deep water depths. Our marine base in Houma provides us with the capability of responding to project mobilizations in a safe, timely, and cost-effective manner."

CSA specializes in consulting services for Federal, State, and private industry clients in multidisciplinary projects, integrating science and technology to evaluate environmental activities throughout the world. CSA offers a wide variety of services related to environmental management and community planning to support clients working in marine, estuarine, wetland, freshwater, and terrestrial habitats throughout the United States and overseas.

For more information, visit www.csaintl.com.

Conference evaluates underwater threats from shipwrecks

An international survey has identified over 8,500 sunken shipwrecks in marine waters around the world, including more than 1,500 sunken tank vessels (≥150 gross tons) and nearly 7,000 sunken non-tank vessels (≥400 gross tons). These wrecks may contain as much as 20 million tons (140 million barrels) of oil and other hazardous materials. Sporadic or continuous leakages or potential sudden massive spillages from these wrecks, 75% of which stem from World War II, pose a continual risk across the globe.

The problem of potentially-polluting wrecks has long been discussed, and recent incidents around the world have caused government agencies and responsible parties to look proactively at preventing catastrophic oil and other chemical releases from long submerged shipwrecks.

The risk of oil and other hazardous materials seeping out of sunken shipwrecks is growing yearly, and the likelihood of leakage or even a massive spill occurring increases, as do the potential costs. Taking a proactive rather than a reactive approach to mitigating this risk will save not only dollars in response costs, but also reduce the threat of environmental and socioeconomic damages.

From the viewpoint of environmental and economic impacts, there is little difference between oil spilling from a sunken vessel and oil spilling from a modern day vessel casualty, with the exception that,while there is no way to predict the location or timing of the next major oil spill, potentially polluting wreck sites are known and the probability of an spill event is quantifiable or even inevitable. There is ample evidence that there are a large number of wrecks in coastal waters that are spills waiting to happen.

Sponsored by the American Salvage Association (ASA) and the North American Marine Environmental Protection Association (NAMEPA), this conference, "Wrecks of the World II: Evaluating and Addressing Potential Underwater Threats," will aim to provide an opportunity for an objective review and discussion of the current state of potentially polluting wrecks and to offer considerations to address the problem.

The conference, Wrecks of the World II, will be held 6 to 7 June 2011.

Fishing for Sustainable Practices to Conserve Fisheries

Global fish production has reached an all-time high, according to research done by Nourishing the Planet for the Worldwatch Institute's Vital Signs Online publication. Aquaculture, — once a minor contributor to total fish harvest — increased 50-fold between the 1950s and 2008 and now contributes nearly half of all fish produced worldwide.

According to the United Nations Food and Agriculture Organization, an estimated 53% of fisheries are considered fully exploited — harvested to their maximum sustainable levels — with no room for expansion in production. Population growth and a higher demand for dietary protein are putting increasing pressure on depleted stocks and threatened ecosystems. Mainstream approaches to fisheries management have focused narrowly on short-term profit and boosting production. Worldwatch's analysis states that practices will need to shift to more sustain-

able strategies to meet demand and support fishing communities.

Increased farming of large predators, such as salmon and tuna, has led to overfishing of prey fish, including anchoveta and herring, which are commonly used as fishmeal. It generally takes at least 3kg of feed to produce 1kg of salmon. The shrinking of the numbers of prey species threatens the entire food chain, putting further stress on large predator stocks. "Even as we depend more on farmed fish, a growing scarcity of fish-feed may jeopardize future expansion of the industry," said Brian Halweil, Worldwatch senior researcher and co-project director of the Institute's Nourishing the Planet project, a two-year evaluation of agricultural innovations.

This could also negatively affect the economies of developing countries, home to the nearly 60% of the world's fishers that are classified as small-scale commercial or subsistence fishers. In Africa, an estimated 100 million people depend on fish from inland sources, such as lakes and rivers, for income as well as protein and much-needed micronutrients like vitamin A, calcium, iron, and zinc. But coastal fisheries across West Africa have declined by up to 50% in the last 30 years due to significant pressure from large industrial fleets.

Fisheries also provide important ecosystem services, such as storing and recycling nutrients and absorbing pollutants. "Fish farmers and the food industry will need to make ecological restoration as much a goal as meeting the growing demand for seafood," said Danielle Nierenberg, Nourishing the Planet co-project director.

Negotiations are currently under way at the World Trade Organization to establish new rules on fisheries subsidies that would eliminate unfair and environmentally destructive policies while ensuring a level playing field and abundant resources for all fishers. But, top-down fisheries management has had limited success in the past. In contrast, fisheries co-managed by local authorities and fishers themselves have emerged as a promising solution to replenishing depleting fish stocks.

Worldwatch's Nourishing the Planet project has traveled to 25 countries across sub-Saharan Africa, shining a spotlight on communities that serve as models for a more sustainable future. The project is unearthing innovations in agriculture that can help alleviate hunger and poverty while also protecting the environment.

These innovations are elaborated in the recently released report State of the World 2011: Innovations that Nourish the Planet. "By focusing on seafood and other often-ignored parts of the food chain, such efforts can help improve livelihoods and protect the ecosystems on which millions of people worldwide depend," said Nierenberg.

For more information, visit www.worldwatch.org.

Successful expedition places humans at lower limits of mesophotic zone

Ocean Opportunity, a Rhode Island-based not-for-profit organization, is has announced the safe and successful return of an expedition to explore and document the natural history of the mesophotic, or "middle light", zone from 200 to 500 feet in the Exumas, Bahamas from 28 April through 8 May. The project was hosted at the John H. Perry Jr. Caribbean Research Center — a facility synonymous with a long lineage of advancements in marine technology and innovations in ocean exploration.

This expedition built upon the team's previous successes in a November project on Andros, Bahamas in which the team worked to 430 feet — more than 3 times the depth of conventional SCUBA diving. The expeditions are being led by Explorer Michael Lombardi, who has been funded by the National Geographic Society to carry out the work.

Collaborators on this recent expedition included individuals from the American Museum of Natural History, the City University of New York, the University of Connecticut, and the University of Kansas.

The deep diving team (including Jeff Godfrey of UConn and NGS/Waitt Grantee Michael Lombardi) conducted several mixed-gas, closed circuit rebreather dives in excess of 300 feet, with one to 400 feet, and another reaching 446 feet. These explorations allowed the team to observe, firsthand, below the presumed sealevel at the end of the Pleistocene ice age, some 370 to 420 feet below today's sealevel. Numerous images, samples, and specimens were gathered and are being evaluated by project collaborators.

Lombardi commented, "Working to the lower limits of this newly accessible realm is wrought with challenges from a technical and psychological perspective. We are working with the best and brightest in the industry to improve human accessibility to this alien environment and bring back data and knowledge from each dive that will advance the necessary life support technologies to improve in-water efficiency, and catalyze scientific discoveries."

When asked why work to the frontier limits of manned exploration?, Lombardi states, "The reaction time, real-time decision making, and personal interaction offered by wet diving at these depths, as opposed to robotics use, brings the raw and intimate experience of human exploration back into the game. Nearly 70 years of marine science has been fueled by the ability to routinely access the shallow coral reef ecosystems — that excitement and creativity made possible by a researcher actually being there catalyzed the marine science field that we know today. We are on the verge of creating an opportunity for the next 70 years. This is a very exciting time for benthic marine scientists."

The project is supported by the National Geographic Society/Waitt Grants Program (Award W140-10), Ocean Opportunity Inc., the University of Connecticut, Shearwater Research, Molecular Products, Small Hope Bay Lodge, Perry Institute for Marine Science, Nocturnal Lights, GMS Concepts, Hugyfot, Dive Exuma, and several individual donors.

World Ocean Council conference to advance industry action on ocean management

The World Ocean Council (WOC) will convene ocean industries on 13 to 14 July in Washington D.C. to foster and facilitate business involvement in the coastal and marine spatial planning (CMSP) process underway in the U.S.

The U.S. has established a National Ocean Council (NOC) that will be implementing CMSP through a series of nine regional programs. The NOC will be holding a National Workshop for government agencies to develop the government's CMSP Strategic Action Plan in late June.

CMSP is defined by the Task Force as "a comprehensive, adaptive, integrated, and transparent spatial planning process, based on sound science, for analyzing current and anticipated uses of ocean, coastal, and Great Lakes areas. CMSP identifies areas most suitable for various types or classes of activities in order to reduce conflicts among uses, reduce environmental impacts, facilitate compatible uses, and preserve critical ecosystem services to meet economic, environmental, security, and social objectives." CMSP seeks to move sea use planning "away from the current sector-by-sector, statute by statute approach," according to the Task Force information.

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A Worldwide Survey of Recent Ocean Observatory Activities: 2011 Update

Contributed by the Ocean Observing Systems Committee, MTS

This year marks the third annual update of "Worldwide Ocean Observatory Activities" first reported in ON&T in 2009 by the Marine Technology Society's Ocean Observing Systems Committee. Each year, the committee manages to turn over a few new sources of information – some from established observatories and others from those being planned or just coming on line. Our goal is to collect newsworthy activities such as these throughout the year and publish them in our monthly newsletters and annual updates.

Europe

The **E**uropean **S**eas **O**bservatory **NET**work (ESONET, http://mars-srv.oceanlab.iu-bremen.de) has set out to investigate standards that may be applicable to integration procedures and workflows required for interoperability in ocean observatories. An interoperability experiment under the auspices of the Open Geospatial Consortium (OGC) has been initiated to evaluate existing standards, and in particular to check the maturity of "Plug and Work" concepts. There are currently three approaches being evaluated at the Expandable Seafloor Observatory (OBSEA) shallow-water Western-Mediterranean observatory of the Technical University of Catalonia: IEEE 1451, OGC Sensor Web Enablement (SWE), and MBARI PUCK (Programmable Underwater Connector, with Knowledge). Ensuing updates will keep abreast of these and other new standards from ESONET.

CYCOFOS – TWERC Cyprus

In order to help protect the lives and livelihoods of the Eastern Mediterranean region's increasing coastal population, in 2010 commercial partner to Cyprus Oceanography Centre, CSnet International Inc., together with their affiliate company CSnet (CYPRUS), Ltd. (Limassol, Cyprus) set about to expand their CYCOFOS (**CY**prus **C**oastal **O**cean **F**orecasting and **O**bserving **S**ystem) scientific observatory (www.oceanography.ucy.ac.cy/cycofos/) in order that it may also serve as the prototype **T**sunami **W**arning and **E**arly **R**esponse system for **C**yprus (TWERC). Deployment of the Offshore Communications Backbone (OCB) portion was completed in September 2010, and this included the trunk cable, seafloor nodes, anode and anchor interface (Figure 1).

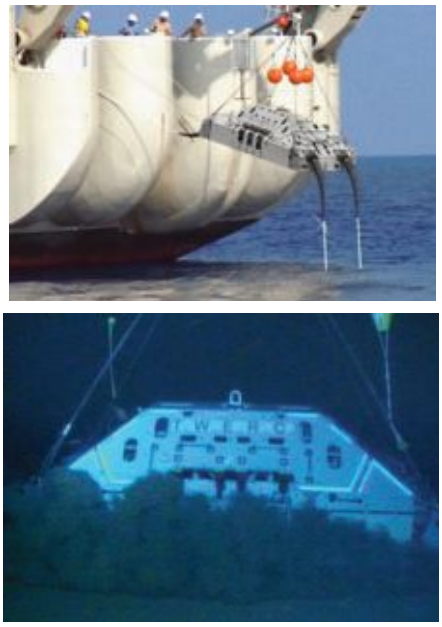


Figure 1 *TWERC node being overboarded from CS Tyco Responder (top) and touching down on seafloor at 2600m (bottom). (Courtesy of Harris CapRock Communications)*

This was followed by the deployment of the surface and subsea portion in November, which included the buoy, anchor and mooring. Two types of sensors are currently being deployed at each TWERC node – an ocean bottom seismometer and bottom pressure recorder. Both the placement of each sensor on the seafloor and the arrangement of the nodes relative to one another (and the distance between them) are critically important.

The orthogonal "Z-shaped" layout of the nodes, each leg approximately 50 km in length, provides the array directionality. That is, by clocking the time of arrival of the signal (either seismic or tsunamigenic) at each of three nodes, the direction to the source can be quickly deduced through simple triangulation.

Since the 2010 update discussing the TWERC project, there has been a tremendous amount of new interest and activity in this region regarding offshore hydrocarbon exploration. Noble Energy Company announced two bonanza natural gas finds, the Tamar field estimated at more than 8 tcf and later the Leviathan field with a staggering 16 tcf estimated yield (reported in Jan/Feb 2011 issue of ON&T). The likelihood of interest, exploration, and subsequent drilling in the lease blocks of Cyprus Exclusive Economic Zone (EEZ) is now extremely high, as these recently announced finds are adjacent to the TWERC.

To minimize obstruction of hydrocarbon activities, each TWERC node was installed essentially at the intersection of adjacent offshore hydrocarbon lease blocks. Similarly, the interconnecting cable was carefully laid along the lease block boundaries, thereby minimizing interference with drilling activities. By placing them at these junctures, each node can service all the adjacent lease blocks in order to provide power and data path to oil & gas customers for environmental monitoring as well as monitoring drilling activities.

TWERC can, thus, serve as a "dual use" observatory, supporting both science and industry. CYCOFOS and TWERC are prime examples of successful science-industry collaborations benefiting both communities and enriching the knowledge base. With the likely prospect of hydrocarbon discoveries in this area, the TWERC observatory is poised to both provide a vital tool to the offshore energy industry and facilitate diligent stewardship of the fragile environment – all the while serving as a sentinel protecting the lives and livelihoods of the surrounding populations, all vulnerable to a very real near field tsunami threat.

The Americas

North America

NEPTUNE Canada

In early February, a Folger Passage Shallow instrument platform was added to the **N**orth-**E**ast **P**acific **T**ime-**S**eries **U**nderwater **N**etworked **E**xperiments (NEPTUNE) Canada observatory (www.neptunecanada.ca).

The platform contained seven new instruments: RDI Acoustic Doppler Current Profiler (600kHz), Nortek Aquadopp single-point acoustic current meter, Nortek Aquadopp Acoustic Doppler Current Profiler, 3D Grasshopper

high-resolution camera imaging system, Biospherical Photosynthetically Active Radiometer (PAR) light sensor, WETLabs fluorometer, and a Sidus HD video camera. Researchers are beginning to use data collected from these sites and will discuss current and planned experiments at this year's annual NEPTUNE Science Workshop. One team led by University of Alberta researchers will use the sophisticated, custom-built eight-lens Grasshopper camera system to make detailed 3D images of sessile (non-mobile) suspension feeders such as sponges, ascidians, and barnacles living beneath the platform.

In April, a Vertical Profiler System (VPS) to be re-deployed on Barkley Upper Slope later this year was connected to the Ocean Technology Test Bed (OTTB) Technology Demonstration Facility (TDF) for "shakedown" testing (Figure 2). Initial results verify the docking mechanism and winch are working properly. Other installation and maintenance missions are planned for NEPTUNE later this year.

Figure 2 *The VPS is lowered into the water from the deck of Island Tug's Georgia Transporter. (Courtesy of NEPTUNE Canada)*

VENUS

Several projects have begun as part of the **V**ictoria **E**xperimental **N**etwork **U**nder the **S**ea (VENUS, www.venus.uvic.ca) Phase II expansion (Figure 3). Activities for Saanich Inlet center on a Buoy Profiling System (BPS). A 7m buoy has been secured from Fisheries and Oceans Canada (DFO) and will be refurbished and customized to support the winching system, which will be cabled directly to the VENUS node. The profiler will transit from the surface to the seabed at 220m depth, and is anticipated to be operational next summer. Two specialized instruments planned for the profiler instrument cage are an Environmental Sample Processor (ESP) that performs genetic analysis in situ, and a new nitrate sensor. In the Strait of Georgia, several initiatives are underway. The Central Node has been upgraded and redeployed, now with eight ports – doubling its capacity to support science packages. The installation of the first COastal raDAR (CODAR) station at Westshore Terminals is on track for this summer. Radial velocity estimates from the Westshore Terminal expand out 25km. When combined with a similar pattern seen from the end of Iona causeway, surface ocean currents will be measured nearly all the way across the southern Strait of Georgia. Three Seakeeper 1000 data acquisition systems and instruments will be installed on three BC Ferry vessels over the next 2 years. These systems will allow VENUS to serve weather and surface properties data from across the Strait in near real-time.

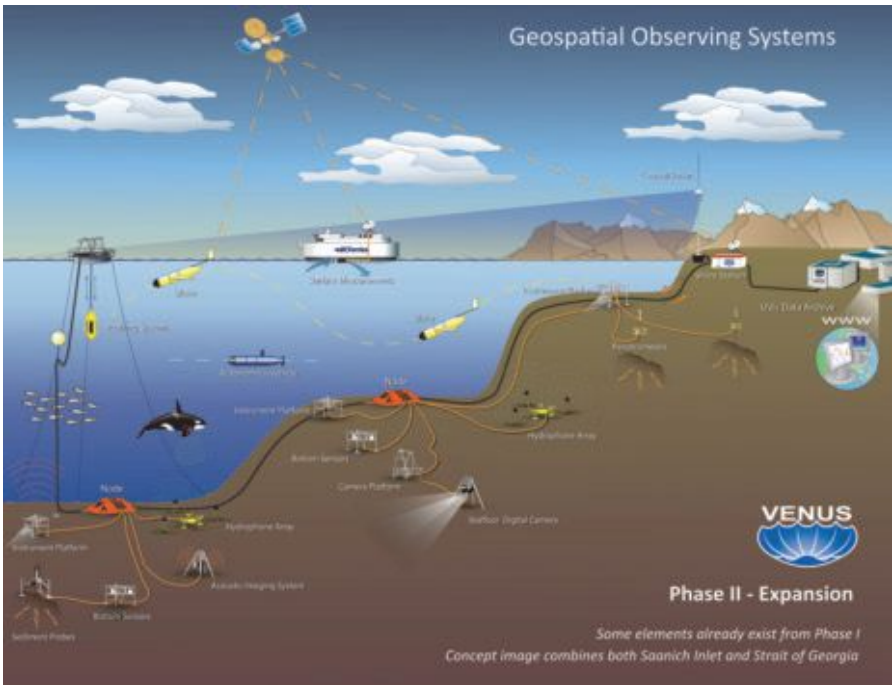


Figure 3 *VENUS Phase II Expansion. (Courtesy of VENUS)*

MARS

In April, a team of researchers supported by Monterey Bay Aquarium Research Institute (MBARI) and the Ministry of Science and Technology of the People's Republic of China installed a suite of ocean-observing instruments for testing in Monterey Bay. These instruments were connected to MBARI's **M**onterey **A**ccelerated **R**esearch **S**ystem (MARS) cabled ocean observatory, about 35 kilometers from shore in 900 meters of water. The instruments, comprised of two packages, will measure seawater acidity, concentrations of chloride, sulfate, nitrate, oxygen, methane and chlorophyll, pressure, temperature, salinity and turbidity. A secondary junction box routes data and electrical power from the main MARS science node to the two instrument packages (Figure 4). After several months of testing in Monterey Bay, components of this system will be installed on a long-term ocean observatory planned for the South China Sea. This new observatory will be used to

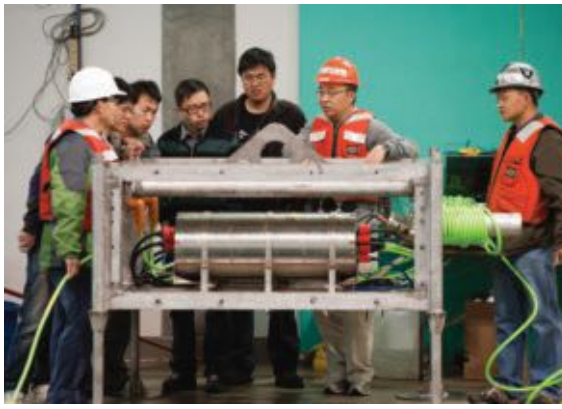


Figure 4 *Members of the Chinese research team prepare the secondary junction box (top) for testing on MARS (bottom). (Courtesy of MBARI)*

study marine ecosystems and biodiversity, tidal currents, earthquakes, and other seafloor phenomena.

OOI CSN & GSN

The **O**cean **O**bservatories **I**nitiative (OOI) (www.oceanobservatories.org), project funded by the National Science Foundation (www.nsf.gov), has made significant progress on a number of technical test and development fronts. OOI will soon deploy two surface moorings in 25 meters of water off the coast of Newport, Oregon, and Grays Harbor, Washington, as part of the Coastal Scale Nodes Endurance Array. These moorings are designed to collect continuous ocean observations over the inner-shelf for the projected 25-year lifespan of the OOI program. In these shallow water depths, waves have the potential to break at the mooring location during large storms, which can pose a significant challenge to mooring survival. As part of the **C**oastal & **G**lobal **S**cale **N**odes (CGSN) development, an engineering and verification test, **I**nshore **M**ooring **T**est 2 (ISMT2), is currently underway to examine a number of mooring subsystems (Figure 5).

Figure 5 *OOI CGSN ISMT2 buoy off the coast of Newport, Oregon. (Courtesy of Craig Risien, Oregon State University)*

At-sea observations will be used to assess the static and dynamic performance of the ISMT2 buoy and evaluate the final candidate design. Woods Hole Oceanographic Institution and its partners, Oregon State University and Scripps Institution of Oceanography are responsible for these coastal and global moorings.

OOI RSN

In addition, the OOI team located at Pacific City, Oregon, completed the drilling necessary to install the power and data undersea cable for the **R**egional **S**cale **N**ode (RSN) cabled component of the infrastructure. These electro-optical cables will ultimately link scientists and others in the user community to streaming real-time data from a variety of sensors on the seafloor and through the water column.

The RSN network of ocean observing sensors in the Northeast Pacific Ocean will be interconnected with approximately 500 miles of electro-optical cable and designed to operate continuously for 25 years. The University of Washington is leading the OOI cabled component effort and has contracted with L3 MariPro Inc., Goleta, California, for the design and build of the OOI RSN primary infrastructure.

IOOS

Critical new data are being added to the **I**ntegrated **O**cean **O**bserving **S**ystem (IOOS®) (/www.ioos.gov/). Beginning this fall, the nation's ocean observing system will include data from electronic tags attached to marine animals.

IOOS joined other federal, state, and academic institutions in Santa Cruz, Calif. last March to begin establishing a framework for integrating these data into the national system. This information will help scientists better understand how marine animals move with the flow of tides and currents and how climate change is altering their migration patterns. Scientists began widely using marine animal tagging technology in the 1990s on tuna, sharks, sea turtles, seals, whales, salmon, squid and crustaceans, among others. Sensors track the animals over long distances for time periods ranging from a few days to more than a decade, collecting valuable data below the surface from remote, and difficult to reach, environments where conventional oceanographic sensing techniques are technically or economically unfeasible. A major challenge is to better synchronize the many different tagging programs and improve data sharing. IOOS is looking to standardize the recording of these data so that scientists can apply the information more broadly. Incorporating biological data into IOOS is one vital step towards expanding availability, and ultimately use, of these data to the broader ocean science community.

Asia

DONET – Japan

Since last year's report of the installation of the 250km looped backbone cable of DONET (**D**ense **O**cean-floor observatory **N**etwork for **E**arthquakes and **T**sunamis, (www.jamstec.go.jp/jamstec/maritec/donet/index.html) and activation of one of its twenty planned observatories, sixteen more observatories have been brought on line (Figures 6,7). An expedition planned for this August will connect the three remaining observatories and perform backfilling burial hole operations for the seismometers. Data is transmitted in real-time to the Yokohama Institute for Earth Sciences at JAMSTEC. On 11 March, seismic waves were observed about 100 seconds after the magnitude 9.0 Tohoku earthquake and the pressure sensing system of DONET was able to confirm the tsunamis arrival one hour later.

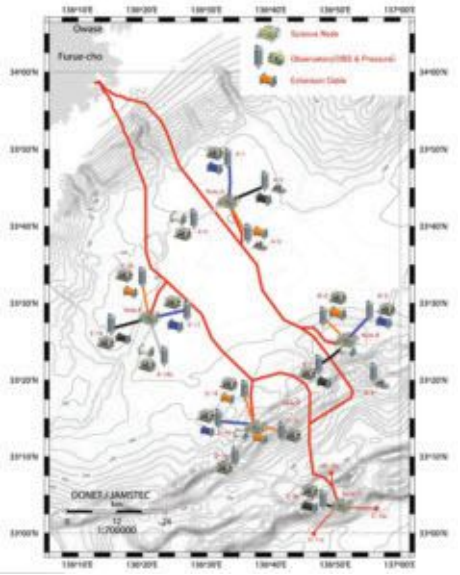


Figure 6 *DONET around the Nankai Trough off Kii Peninsula, Japan. (Courtesy of JAMSTEC)*

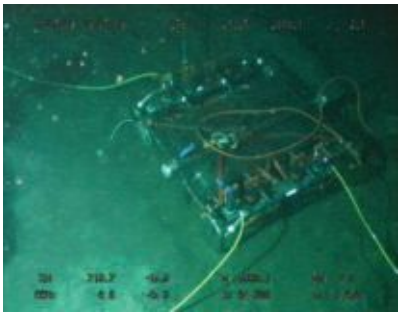


Figure 7 *DONET science node connected to four observatories. (Courtesy of JAMSTEC)*

Indian Ocean Observing System

The National Institute of Ocean Technology Ministry of Earth Sciences India reports that the 12 metocean buoy network has been re-established in the Indian sea (Figure 8). Additional deep sea instrumented buoys were deployed in 2

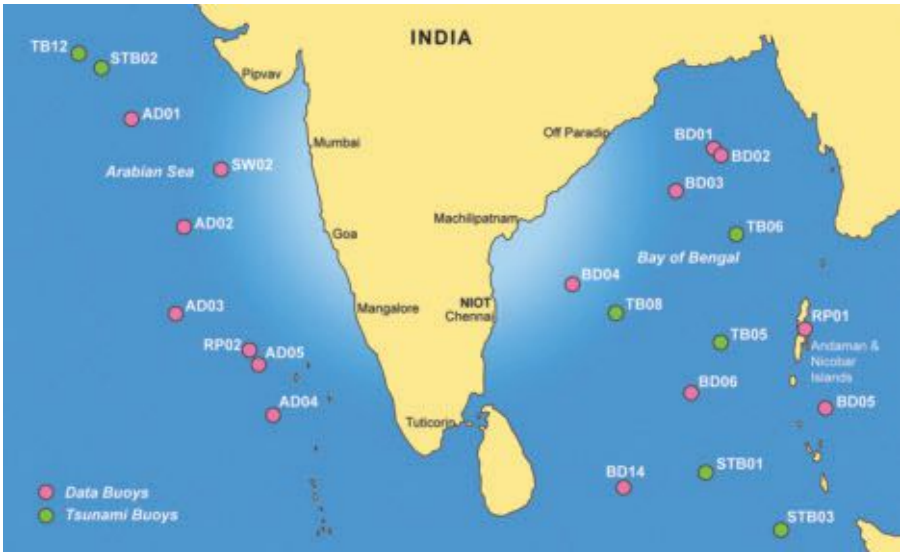


Figure 8 *Data and Tsunami Buoy Locations Surrounding India (Courtesy of NIOT)*

new locations and results are leading to new findings; and a third buoy to monitor coral reef ecosystem was installed in Andaman Islands. India has joined UNESCO-IOC in an inter-comparison exercise of National Institute of Ocean Technology (NIOT) buoys with MRU and ocean data as a part of a Pilot Project on Wave Measurement Evaluation and Test (PP WET). An optical buoy will be installed in the western group of islands to calibrate and validate Indian satellite data. These data are transmitted to the sister Institute Indian National Centre for Ocean Information Services and data sets are available in the Global Telecommunications System (GTS).

Tsunami buoys were recently installed in the Bay of Bengal and Arabian Sea and four buoys are operational. Vandalism is a major challenge faced by this moored buoy program. In order to address this issue, for the first time a Regional Workshop on Establishing a Cooperative Mechanism for Protection of Met-Ocean Data and Tsunami Buoys in the Northern Indian Ocean Region was organized in early May at NIOT Chennai. This workshop was attended by 80 delegates from 12 countries with 8 Bay of Bengal rim countries and with participation of 15 non-governmental organizations (NGOs) and civil societies. This is the first regional effort by the United Nations to call for the protection of data buoys by member countries. IOC UNESCO was represented along with several industry partners. A working group has been established and a regional Memorandum of Understanding (MoU) is under consideration to protect these buoys.

The recommendations from this working group could be the role model for other countries and regions to follow in this regard.

Oceania

NRS – Australia

Since last year's update, the **N**ational **R**eference **S**tations (NRS) have moved from a start up to fully operational state with all 9 sites now instrumented and plankton and nutrient sampling well underway. This includes the most remote site at Ningaloo Reef, where four physical samples have now been taken and a site previously instrumented by Australian Institute of Marine Science (AIMS) upgraded with Water Quality Monitoring (WQM) sensors. Other NRS sites are being upgraded with Acoustic Doppler Current Profilers (ADCPs). At the North Stradbroke Island NRS, a lander was recently deployed with a gimbled mounted ADCP (Figure 9). Sites are also being used by other projects to co-locate instruments. For instance, at the Maria Island NRS, a recent addition to the suite of sensors deployed is a pCO2 telemetry buoy which will be used to study ocean acidification.

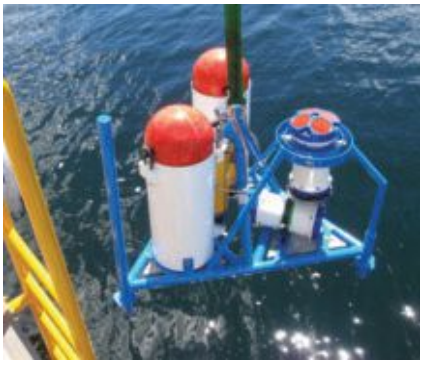


Figure 9 *North Stradbroke Island NRS Lander. (Courtesy of Phil de Boer, Coastal Moorings Team, CSIRO)*

TASCAM – New Zealand

In April, a team of researchers installed an ocean-monitoring buoy in Tasman Bay, at the northern end of New Zealand's South Island (Figure 10). The buoy and its connected instruments comprise the **TAS**man Bay, **CA**wthron, and **M**BARI (TASCAM) system (www.cawthron.org.nz/coastal-freshwater-resources/tascam.html). This system resulted from a year-long collaborative effort by the Cawthron Institute, the Tasman District Council and MBARI, with funding from the Royal Society of New Zealand.

Figure 10 *TASCAM Ocean Monitoring Buoy Location. (Courtesy of Cawthron Institute)*

Although Cawthron researchers have installed scientific instruments in Tasman Bay before, this was the first time they have set up a long-term, real-time monitoring system. The system will be used not just by scientists, but also by local environmental management agencies, aquaculture operators, and even recreational fishers.

The new system includes a variety of instruments that measure temperature, salinity, turbidity (sediment), and chlorophyll – all indicators of the quality and productivity of the coastal waters. In addition, a current meter mounted on the seafloor will measure ocean currents. The staff of the Cawthron Institute designed the new buoy based on technology used on MBARI's moorings in Monterey Bay.

For more information about this article or to make a contribution contact dkocak@harris.com.

Ocean Energy

DNV is appointed as CVA for Cape Wind
DNV is appointed as the Certified Verification Agent (CVA) for the Cape Wind Project, the first offshore wind farm to be built in the U.S. The role of DNV as CVA is to conduct third-party design reviews, inspections, and other verification activities. U.S. regulations require that offshore wind developers submit a Construction and Operations Plan (COP) and that an independent third party organization is appointed to verify and certify structural aspects of the wind farm installation. As the CVA, DNV will maintain an independent role throughout the project, acting as BOEMRE's eyes and ears. On 19 April 2011, Salazar announced approval of Cape Wind Energy project Construction and Operations Plan.

BOEMRE to Prepare an Environmental Assessment for Marine Hydrokinetic Technology Testing Offshore Florida
BOEMRE announced that it is taking the first step toward issuing a lease that would authorize the testing of equipment designed to use ocean currents offshore Florida to generate electricity on the Outer Continental Shelf (OCS). This is the first lease application BOEMRE has received to test ocean current equipment on the U.S. Outer Continental Shelf. Florida Atlantic University has applied for a lease to deploy an experimental demonstration device, which is the action that has prompted the need for BOEMRE to conduct an Environmental Assessment (EA). The proposed lease area covers three OCS blocks located approximately nine to 15 nautical miles offshore Fort Lauderdale. BOEMRE is preparing an EA to consider the environmental consequences associated with issuing a lease, which will include environmental impacts that may result from installing a buoy, deploying small-scale ocean current devices, and operating a deployment vessel in the area that would be covered by the lease. The EA will consider environmental issues, including impacts to benthic habitats, marine mammals, sea turtles, pelagic fishes, and existing human uses. BOEMRE identified four proposed areas offshore Florida as priority areas for testing ocean current technology and collecting resource data.

Ted Johnson joins OTE Corporation
OTE Corporation, the developer of systems using the natural temperature gradient of the ocean to produce clean, sustainable base-load power and fresh, potable water, announced the appointment of Dr. Ted Johnson as Vice President, OTEC (Ocean Thermal Energy Conversion) Program Development. An internationally recognized pioneer in ocean-derived energy, Dr. Johnson will play a critical role in helping OTE Corporation bring the world a competitive, base-load (24/7 available) energy alternative to fossil fuels. Previously, Dr. Johnson served as the Director of the heritage Lockheed Corporation's Ocean Systems Division, which led the development of the world's first successful floating OTEC pilot plant (Mini OTEC) off the coast of Hawaii and also as the OTEC Business Development Director in Lockheed Martin's New Ventures Organization. In his new role at OTE Corporation, Dr. Johnson will work with worldwide customers, governments, team members, and other stakeholders to achieve the reality of OTEC as a viable source of secure, sustainable, and clean power.

Wind Industry reports growth as renewables
The U.S. wind power industry installed 1,100MW of new capacity in the first quarter of 2011 and entered the second quarter with another 5,600MW under construction, the American Wind Energy Association (AWEA) announced on 28 April. The under-construction figure is nearly twice the megawatts that the industry reported at the same time in both 2009 and 2010. The total U.S. wind fleet capacity now stands at 41,400MW, which is enough to supply 10 million homes. The first quarter's new capacity came online in 12 different states, with some seeing double-digit growth. The states adding the most capacity were Minnesota (293MW), Washington (252MW), and Illinois (240MW). AWEA reported that one third of the 5,600MW currently under construction is located in California, Oregon, and Washington.

Aubin launches offshore lifting system for renewables sector

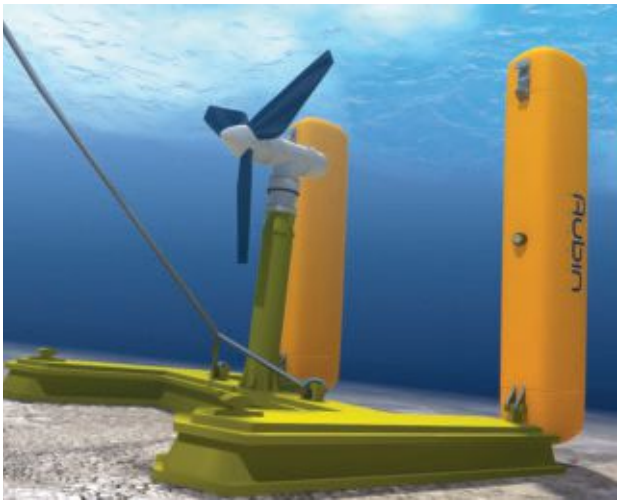
Aubin, a leading independent supplier of specialist chemicals to the energy industry, has launched a game-changing new product that could save millions of pounds when installing offshore renewables infrastructure.

The Gel Lift System (GLS) offers the potential for significant cost savings and risk reduction in the critical installation phase of offshore renewables development.

The technology, which uses a novel low-density gel, can be used to install all types of offshore renewables, including wind, wave, and tidal. The gel, which can be reused is non hazardous and environmentally responsible.

By reducing the specification and complexity of cranes and crane barges required during installation, GLS supports the use of more commonly available vessels, generating savings typically in excess of £100,000 per day, thereby accelerating the uptake of renewable technology development in UK waters.

The ability to promptly install and commission any renewable system once manufactured significantly reduces yard/storage space requirements and the level of upfront investment required from developers. Aubin believes this feature will allow more UK ports to be used for such installation projects.



Aubin, together with Aberdeen-based engineering partner Ecosse Subsea, are currently developing installation techniques utilizing GLS for offshore wind, wave, and tidal technologies. Aubin's GLS can support infrastructure weighing more than 1,000 tonnes and has an operational depth of 100m, making it suitable for most European locations identified for potential renewables developments.

Aubin has worked with leading industry professionals on development work and feasibility testing. GLS is a spin-off from Aubin's DeepBuoy product, used for lifting, supporting and lowering heavy subsea structures to a depth of 3,000m for the global deepwater oil and gas industry. GLS is also suitable for developing small field developments and decommissioning old infrastructure, such as the many smaller structures and subsea tie-backs in the southern North Sea where it is not economically viable to rely on cranes.

The company received SMART funding to develop the GLS technology from the Scottish government scheme providing financial assistance to individuals and SMEs to help support commercially viable projects that represent a significant technological advance.

Salazar, Bromwich announce elimination of redundant step for offshore renewable energy leasing

Secretary of the Interior Ken Salazar and Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) director Michael R. Bromwich announced that BOEMRE has finalized a proposed rule that will eliminate a redundant step in the non-competitive leasing process for commercial renewable energy development on the U.S. Outer Continental Shelf.

"This streamlined approach could cut up to a year off the leasing process for some commercial wind energy projects in the Atlantic," Secretary Salazar said. "It would increase regulatory efficiency without affecting our ability to rigorously review, analyze, and monitor projects to assure they are carried out in a safe and environmentally responsible manner."

"This rule eliminates a redundancy in the offshore renewable energy leasing process," Director Bromwich said. "It will make the process more efficient and will shave significant time from the current renewable energy project timetable. It is part of our ongoing effort to eliminate unnecessary delays in the process and encourage commercial offshore wind development."

This action is being taken because of a requirement in the federal offshore renewable energy regulations related to the non-competitive leasing process. Under the current regulations, if BOEMRE initiates the commercial wind leasing process and only one entity responds expressing interest in acquiring a lease in that area, the bureau must still issue a second Federal Register notice request for interest to ensure there is no competitive interest in that area. This process can take several months, and the Bureau determined that it is unnecessary and redundant. The rule eliminates the requirement for the second request for interest and potentially could save up to 6 to 12 months in the leasing process.

BOEMRE published the proposed rule on 16 February 2011. After careful analysis of the public comments received, the bureau determined it could move forward to finalize the rule. The final rule will be effective 15 June 2011. The notice is available for public inspection on the Federal Register website at www.archives.gov/federal-register/public-inspection/index.html.

Scottish wave project selected as 1 of 12 UK bids for European funding


Aquamarine Oyster

A collaborative project bringing together three of Europe's leading utilities and wave energy technologies provided by Aquamarine Power and Pelamis has been selected by the UK government for a major European funding bid.

The Pentland Orkney Wave Energy Resource (POWER) Ltd project is the only wave energy bid being put forward by the UK government to the European Investment Bank (EIB) for consideration in the first round of the EU's New Entrant Reserve (NER300) scheme – a fund worth around EUR4.5 billion to support carbon capture and storage and innovative renewable projects across the European Union.

The POWER project aims to deliver the world's first large-scale grid-connected demonstration of a wave energy farm with a total generation capacity of 28MW.

If successful, the project will comprise 10 nearshore Aquamarine Power Oyster 3 devices and 24 offshore Pelamis machines within the Pentland Firth and Orkney Waters leasing area, operating in multi-device array configurations. Both of these technologies are leaders in their field, having been successfully demonstrated at small scale. The project will have a single point of connection to the onshore grid.

The POWER project and bid, which was structured and coordinated by the Scottish European Green Energy Centre (SEGEC), is a collaboration by ScottishPower Renewables (SPR), E.ON Climate & Renewables (E.ON), and Brough Head Wave Farm Limited (BHWFL) — a joint venture between SSE Renewables (SSER) and Aquamarine Power, each of whom have demonstrated an unrivalled commitment to the marine energy sector.

Data and learning captured during the development and operation of the project will be used directly to accelerate the commercialization of wave energy technology and the development of the industry in Europe.

By providing a final pre-commercial large-scale demonstration of Aquamarine Power nearshore Oyster 3 devices and offshore Pelamis machines within the Pentland Firth and Orkney Waters development area, the POWER project would be a significant milestone in the development of the wave energy sector in Europe and worldwide.

Aquamarine Power secures seabed rights for potential 40MW Lewis wave energy sites

The Western Isles could capitalize on Scotland's green energy boom following the news 19 May that wave energy company Aquamarine Power has secured seabed leases to capture up to 40MW of wave energy off the west coast of Lewis. Following a series of meetings and consultation with the local community, stakeholders, and officials, the Edinburgh firm has obtained leases from seabed owner the Crown Estate. This will enable them to start environmental and feasibility studies and continue working with the local community and other key groups on the potential to install the company's Oyster wave energy technology. Aquamarine Power will need to secure planning consents from Comhairle nan Eilean Siar and government regulator Marine Scotland before any development can take place.

Representatives of the company have already met with local landowners to discuss their outline plans and issued a "scoping report" 20 May seeking views of statutory and local consultees on the draft proposal. The company will undertake extensive environmental monitoring and consultation before formally submitting an application to Marine Scotland later this year.

Aquamarine Power has secured two leases. One is a 10MW demonstration lease for a site between Siadar and Fivepenny, known as the Galson site; the other is a 30MW lease granted under the Crown Estate's recent "Saltire Prize" leasing round – which offers an area of search between Bàgh Dhail Beag and Tràigh Shanndaigh.

The company will take guidance and work closely with local communities and stakeholders to identify the most appropriate 30MW site within the search area. Once this has been identified and Aquamarine Power has secured all permissions and consents required, they will seek a formal lease with the Crown Estate. The lease area will be known as the North West Lewis site. Following this, the rest of the search area will become available to other potential developers seeking a seabed lease.

The development has the potential to see up to 40 Oyster nearshore devices installed across both locations on an approximate 2km stretch of coast. The proposed sites would have a total installed capacity of 40MW and could provide enough energy to power 38,000 homes.

The company has officially registered its intent to use the Lewis site to compete for the Scottish Government's Saltire Prize, a £10 million global prize for the wave or tidal technology that generates the greatest volume of electrical output over 100GWh over a continuous 2-year period using only the power of the sea.

Sheringham Shoal offshore substations in place

Two large offshore substations, each weighing nearly 1,000 tonnes, arrived off the North Norfolk coast on 3 May to be installed at the Sheringham Shoal Offshore Wind Farm. The substations will channel the energy generated by the Sheringham Shoal Offshore Wind Farm to the onshore substation at Salle for distribution into the National Grid.

Heerema, Alstrom's subcontractor, constructed the offshore substations at its yard in Hartlepool in North East England.

The successful installation of the two substations is a key milestone in the project. However, this is only the beginning. There are many challenges ahead that require detailed planning and co-ordination, and progress is dependent on good weather conditions. In early summer, the main hook-up work and commissioning of the offshore substations will start and is expected to continue throughout the coming months. Erection and commissioning of turbines will begin during the summer and continue through the remaining year and first quarter of 2012.

When completed, the Sheringham Shoal Offshore Wind Farm will generate 317MW of electricity, enough to power 220,000 domestic homes. This electricity will be distributed from these two offshore substations via the sea bed cables to landfall at the North Norfolk coastal village of Weybourne, and from there by underground cable to a new purpose-built substation at Salle, near Norwich, before entering the National Grid.

The Sheringham Shoal Offshore Wind Farm is owned equally by Statoil and Statkraft through the joint venture company Scira Offshore Energy Limited. Statoil is the operator for the project during the development phase. Scira will operate the wind farm once completed.

A 3D rendering of the Mooring and Telemetry Buoy (left). Sr. Engineer Geoff Beiser boards the MTB during testing to inspect a hatch compartment (top).

FAU's Southeast National Marine Renewable Energy Center achieves major milestone

The Southeast National Marine Renewable Energy Center (SNMREC) at Florida Atlantic University recently accomplished a major milestone in the establishment of its testing capabilities. The Center successfully completed offshore testing of a key component of its small-scale ocean-current turbine test berth – a Mooring and Telemetry Buoy (MTB). The MTB test was the first step of a multi-phase strategy to create a real-time offshore ocean energy test facility and scientific observatory.

The MTB was tow-tested offshore of Fort Pierce, where engineers from Harbor Branch Oceanographic Institute and SNMREC joined the crew of the M/V Thunderforce to verify buoy performance as designed. Upon reaching the predetermined location in the Gulf Stream about 18 miles east of Fort Pierce, the buoy attachment was reconfigured. The test configuration, which emulates how the buoy would be anchored offshore, was used to determine how the buoy would behave under various current speed and sea heading conditions. The objectives of the MTB system tow tests were to verify buoy stability, tracking, and wave response as well as to verify onboard scientific instrument functionality and planned maintenance procedures.

The steel-hulled buoy is approximately 21-ft. long and 10-ft. wide and its unique hull design is shaped to survive strong currents. Onboard the buoy, there are a variety of renewable power sources such as solar panels, small wind turbines, and sailboat water turbines that provide power for onboard oceanographic instruments, safety and navigation systems, and wireless communication. The safety and navigation systems include active radar target enhancers and a Class "A" Automatic Identification System transmitter. Wireless communication systems also are included to relay collected data to shore and provide the ability to monitor buoy health remotely.

Engineers now plan to make minor modifications based upon test results to improve performance and will complete final integration of the measurement, communication and power systems. After this phase, the Center will be ready to anchor the buoy offshore this summer.

Video footage from the test is available online at www.eng.fau.edu/SNMREC/BuoyTowTest1

For more information, contact Susan Skemp at 561-297-2339 or sskemp@fau.edu.

BOEMRE reduces area offshore Massachusetts for commercial wind energy leasing

The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) announced that it is reducing the area under consideration for future commercial wind energy leasing on the Outer Continental Shelf (OCS) offshore Massachusetts. This reduction is in response to multiple comments received in response to a Request for Interest (RFI) issued on 29 December 2010. The RFI invited the public to provide information useful to BOEMRE in evaluating the suitability of the identified area for potential future leasing. The RFI also asked that wind energy developers describe their interest in acquiring commercial leases for potential future projects. This announcement comes as BOEMRE holds a joint meeting with the Rhode Island and Massachusetts Renewable Energy Task Forces to discuss activities around their Area of Mutual Interest.

"We have heard significant concerns from the people of Massachusetts, and we have acted on those concerns," said BOEMRE Director Michael R. Bromwich. "BOEMRE is committed to continuing the public engagement process as we look to identify the potential areas for offshore energy development in the federal waters south of Massachusetts."

In response to the RFI, BOEMRE received nearly 250 comments, including several from the Massachusetts commercial fishing community, the Governor's office, and the congressional delegation, that argued for the reduction of the area under consideration. Comments also addressed other uses of the sea and seabed (e.g. environmental, cultural, and socioeconomic) and expressions of interest for commercial wind.

BOEMRE has received 11 submissions from 10 companies describing commercial leasing interest within the RFI area. BOEMRE is reviewing these submissions for completeness and also to evaluate legal, technical, and financial qualifications to hold an OCS renewable energy lease.

BOEMRE has not yet identified an area that may be offered for leasing or approved for subsequent development. Next steps include continued meetings of the Massachusetts Renewable Energy Task Force to inform members of the submissions of interest and comments received and to discuss next steps, including the identification of a "Smart from the Start Wind Energy Area" and the development of a Call for Information and Nominations. After consulting with Task Force members and stakeholders, BOEMRE may further modify the area under consideration for potential commercial wind energy leasing.

Universities to measure impact of Welsh tidal power

From the tidal races off Anglesey and West Wales to the tidal flow of the Bristol Channel, the Welsh coastline has great potential for renewable marine energy. New technologies to harness this potential are now under development as companies try to evaluate whether tidal power is commercially viable. However, the challenge is not just to exploit the power of the tides, but to safeguard the coastal environment and ecosystem at the same time.

Welsh universities are teaming up to carry out an environmental assessment of one of the most promising sites for marine energy, off the Pembrokeshire Coast. Operation Celtic Odyssey is a collaborative research program, applying the latest survey and monitoring techniques to establish the environmental suitability of the coastline for tidal energy development.

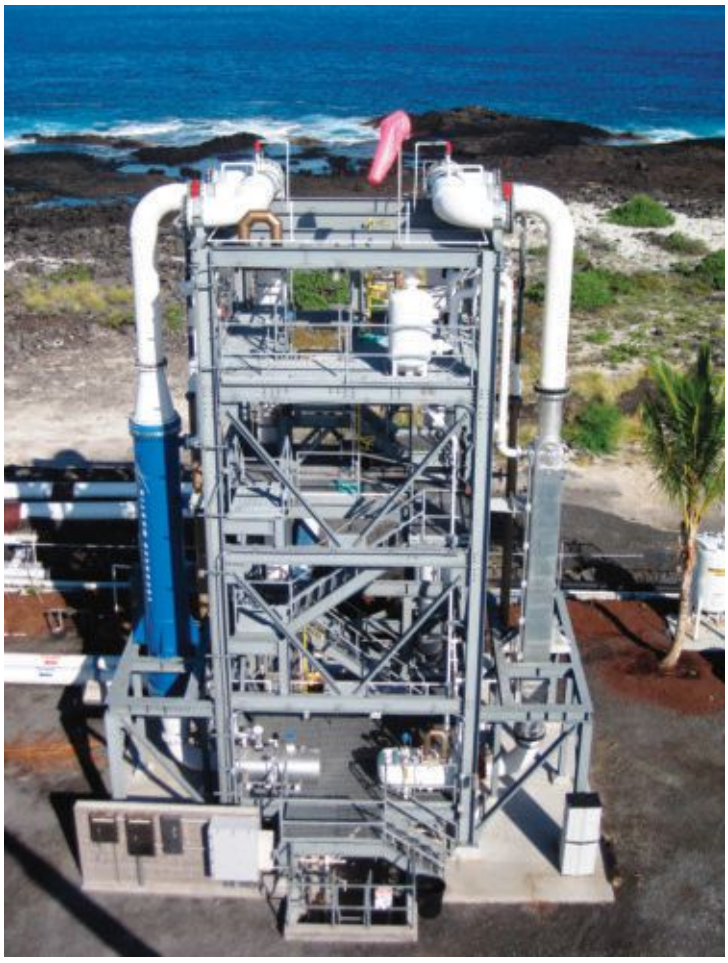
The St. David's peninsula and the adjacent coastline around Ramsey Sound, the westernmost points west of mainland Wales, are fully exposed to the storm waves of the Atlantic and constantly subject to the ebb and flow of major tidal streams. The area has been identified by the Welsh Assembly Government as a potential site for tidal energy generation and one pilot test project is due to start shortly.

Makai completes OTEC heat exchanger test facility

Makai Ocean Engineering, Inc. of Waimanalo, Hawaii has begun operation of an OTEC Heat Exchanger Test Facility specifically designed and constructed by Makai for Ocean Thermal Energy Conversion (OTEC) applications. This unique facility, constructed at the Natural Energy Laboratory of Hawaii Authority (NELHA) at Keahole Point, Hawaii, is specifically designed to test the overall performance of custom designed OTEC heat exchangers with regard to their corrosion characteristics, manufacturability, fluid dynamic losses and thermodynamic performance. The first generation heat exchangers currently being tested were supplied by Lockheed Martin and Chart Energy and Chemical.

Heat Exchangers will be one of the most critical components in any commercial OTEC plant. They will be the single most expensive component and will have a major effect on overall plant efficiency. Small changes in heat exchanger performance have immense economic consequences for commercial OTEC providing justification for the development of this 46-ft. tall structure capable of testing multiple heat exchangers in realistic OTEC conditions. The test facility, which was jointly funded by NAVFAC, ONR, Hawaii Natural Energy Institute and Hawaii High Technology Development Corporation, is scheduled for a dedication ceremony on 8 July 2011.

For more information, visit www.makai.com



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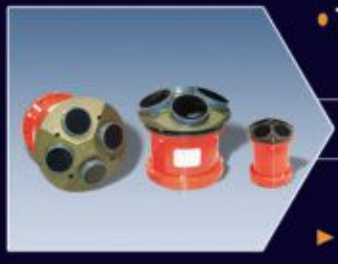

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Challenges for Wave Energy: Survival!

By Dr.Phil Hart

Getting energy from waves is not difficult. Take a quick look on the Internet and you will soon find easily tens, potentially hundreds of companies or individual inventors who will describe in some detail how simple it is. A plethora of alternative solutions abound, all built on a few relatively straight forward techniques and all compelling in their own special way. But if that rather brazen statement is true, and on a fundamental if simplistic basis it is, then why isn't the industry at the head of the renewable space?

The answer is as simple as the original statement is simplistic. Getting power is simple, but getting large power efficiently and reliably, from a survivable system, and over an extended period of time is a real challenge. It's these issues that are far too often neglected or brushed over by the uninitiated; concurrently, it's these issues that dominate the minds of the designers for the progressive companies working in the field.

Let's examine the magnitude of the issues we're up against, starting with the utility company's main aim — cheap and efficient power. Conceptually at least, building a basic device to turn mechanical wave energy into electricity doesn't involve a lot of complex engineering. Couple the heave, pitch, or surge energy (normally) to some part of a mechanism which can move relative to a second stationary part, and you've done the job. Get the unit into the water and it likely becomes obvious that for a specific and narrow set of wave conditions you normally get reasonable performance, power comes out and you can rest temporarily pleased with your work. Unfortunately, it will also become obvious, at least as quickly as the happy discovery you just made, that for the vast majority of wave conditions the power you obtain falls off this impressive power performance sweet spot, normally precipitously. You have just rediscovered resonance or lack thereof.

To smooth out this performance curve and widen the range of waves in which a device produces efficient power, the industry builds more complex structures and control systems than might initially be envisaged.

The basic structural design seeks to place the base resonance of the device at the most sensible and advantageous point for the wide range of waves the device will encounter, which is complicated by and traded against the desire to build a single device for a range of locations. Recognizing that wave conditions vary significantly with geographic location, it is generally possible to design individual elements of the structure that can be modified or tuned at the build stage to suit specific sites.

The internal control systems are by definition dynamically variable and can be mechanical, hydraulic, or electrical in nature. Many control strategies are available, and there is a fairly large body of knowledge that can be drawn upon from within and without the industry. However, as has been proven over the years, wave energy devices behave in some unique (and unusual) ways that require significant time, effort and resource to understand, hone and then verify at both small and large scale. The good news is that, when done correctly, adaptive control strategies can make impressive gains in overall power and widen the sweet spot of operations for a device across the wave spectrum.

Companies in the industry are working extensively on the control problem and are making inroads across the board to exploit the available energy effectively. The basic capture efficiency of the available wave energy is relatively low for all wave energy devices, numbering in the low double digit percentages at best. To its benefit though, given that the wave energy available is typically 20 to 60kW/m^2, even the relatively low overall power capture efficiency gives significant overall output power, and it's that aspect predominantly that makes wave energy so attractive for the future. Advances in control strategies make a difference at this very early stage in the power chain and, therefore, have a large effect on the cost of energy produced.

Perhaps a more pressing challenge overall then becomes making a device that performs well for very long periods in the ocean, numbered in tens of years at least. Survivability and reliability are the keys, but while they are coupled criteria, they have very different drivers.

Reliability is governed by the very detailed aspects of the system design, such as whether a generator can work over 25 years, can a hydraulic system switch valves every 10 seconds for the life of the system, and what is the wear out rate for solid state circuitry? The designer is occupied by these most basic of choices, but concurrently challenged by the cost effects of failure within systems that are often difficult and expensive to get to in the field. There are two fundamental solutions, either to design redundancy into the system or to include excess capability, both of which directly and negatively affect cost. Reliability engineering is, therefore, a real and essential aspect of wave

energy converter design and is, perhaps, not paid the attention that it deserves in many cases, especially by those companies who are early in the development process.

Survivability is much easier to quantify at a high level, but can be quite troublesome to address. Any site can be characterized by 1) a joint probability distribution of wave heights and time periods, 2) a significant wave height for a given time period, and 3) the local currents (both wind and tidal driven). Given these data, the designer can establish, if they have access to accurate computer models, the fatigue and ultimate force loadings against which to design their structure. The challenge here comes from the magnitude of the forces encountered that can be daunting to the uninitiated and experienced alike. Take for example, the 100-year return period wave for the EMEC site in Scotland. In 55m of water, the design storm wave exceeds 28m in height and is coupled with an in-line current which exceeds 1.3ms-1; not insignificant in anyone's book. Many strategies can be applied to assist the system to survive such conditions, but even given the analysis and data available, the wave power industry has seen too many dramatic failures in its somewhat colorful history. Much of the issue here stems from unexpected behaviors of the design in the sea, as it is there that the developer rapidly discovers that there is just no substitute for the learning obtained from wave tank tests and smaller scale deployed devices.

In the practical case, economics, as usual, has its key part to play in survival design as it is simple to just "throw metal" at the problem if money is not a problem, however it usually is! The challenge of making a survivable device that produces electricity at affordable levels makes steel vs. cost per kWh the wave energy converter designer's bête noire. Over the years some companies have made great inroads in survivability engineering and, as evinced by some of the more recent deployments (such as Ocean Power Technologies' grid-connected PowerBuoy in Hawaii), the good news is that long term survivable wave energy converters can be produced. Rightly, some of the more sensible companies have made survivability their primary design criteria for their prototype and early stage commercial devices. This makes a lot of sense; slimming cost out of a design moves the mind set from an inventive mode to a pure engineering mode, one to which a much wider group can bring their skills to bear with excellent results. New entrants to the industry would be wise to heed this particular piece of corporate learning.

We've established above that wave power converter devices can be built; can be made relatively efficient and adaptive extractors of energy; with care can be made reliable over extended periods; and can, with the proper staged development approach, be made survivable in extreme conditions. The final challenge then remains economics.

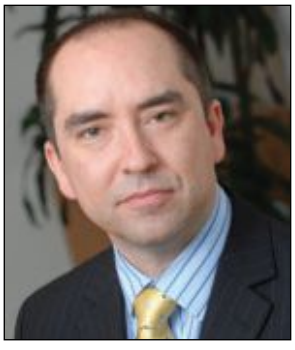
The wave industry is perhaps 10 years behind the wind industry, which unsurprisingly suffered from most of the issues cited above. However, the wave energy industry is coming of age in a time of poor economic climate and low availability of funds. The money markets are certainly much less amenable to risk than they were in the late 1990s, which makes the roll out of any new technology a significant challenge. Counter to that is the cost (economic, political, and ecological) of the world's oil and gas supply and the general fear and potential cost (both economic and ecological) of the nuclear industry. Recent spikes in the price of oil and the harrowing nuclear events in Japan have only served to heighten awareness of energy issues in general. If we choose to limit nuclear energy growth within the energy mix,

as seems likely certainly for the immediate future, and then oil and gas becomes priced so highly that it essentially limits itself, a mix of other technologies has to step in as energy requirements continue to grow.

Wind energy leads the renewable charge without a doubt, but others are available and will play their part. All renewable technologies have issues. None are perfect, and neither is wave energy, but it does have some key advantages.

Wave energy is predictable, in that over a relatively short period of time it statistically gives a reliable amount of energy which can be modeled prior to that time. It is wide spread, in that the wave activity in most coastal areas is suitable for extraction by the "right" design of device. It is dense, in that the amount of energy available is large per unit of area. It is in the right place, in that the majority of the world's populations live near the coast where the wave energy will be produced.

Wave energy, therefore, definitely has its part to play in the new era of energy diversity. The ecological and political drivers to energy independence and sustainability will hopefully counter the poor economic climate and supply the impetus for adoption of this key resource. The technologies exist; many prototypes and some commercial-scale demonstrators are in the water proving that the industry has passed the first and second major hurdles. Some distinct and vibrant companies, with proven and believable technologies, are on the cusp of industrial and commercial reality and are actively working on array deployments. It will be interesting to look back in 5 years time and see what happened…



Dr. Phil Hart is a distinguished member of the Ocean News & Technology magazine Advisory Board and the Chief Technology Officer for Ocean Power Technology (OPT).

Norway's defense budget increased
The Norwegian government's revised national budget proposal for 2011, approved by Labor Prime Minister Jens Stoltenberg's Cabinet on 19 May means $63 million in additional spending for the armed forces this year. The increased price for oil and gas on world markets has proved to be hugely important to improving Norway's ability to fund special budgetary areas, such as defense. The dividends paid to the state by the Pension Fund Global, which invests Norway's oil and gas earnings, has being steadily rising since mid-2010. The sovereign wealth fund had a market value of more than $600 billion by April.

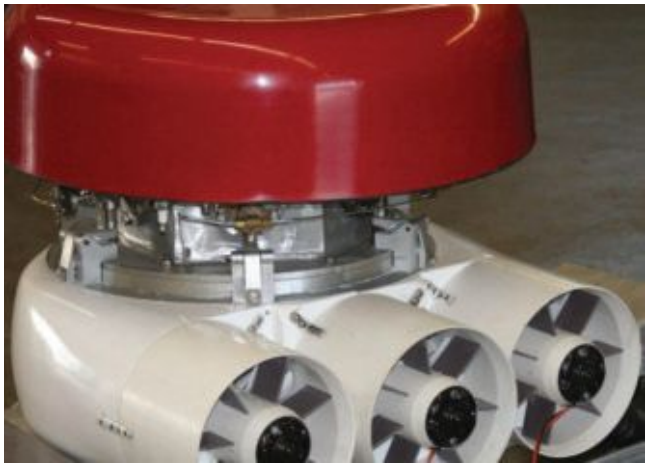
China's Defense Minister to visit Philippines
China's Defense Minister Liang Guanglie visited the Philippines on 21 May, the Chinese embassy said, on a trip seen as deepening military ties amid a sensitive territorial dispute. There have been fresh tensions around the Spratlys, a reputedly oil-rich South China Sea island chain claimed in whole or in part by China and the Philippines as well as Brunei, Malaysia, Taiwan, and Vietnam. In March, Manila accused Chinese patrol boats of shadowing a Philippine vessel on an oil survey mission in the Reed Bank. Beijing later brushed off the protest while warning against any oil exploration without its consent in waters it claims in the South China Sea.

NATO attacks eight Gadhafi warships
NATO aircraft hit eight warships of Libyan leader Moammar Gadhafi's forces overnight 20 May in the ports of Tripoli, Al Khums, and Sirte, the Atlantic alliance said in a statement. "NATO and coalition air assets continued their precision airstrikes against pro-Gadhafi regime forces overnight with a coordinated strike against pro-Gadhafi forces in the ports of Tripoli, Al Khums, and Sirte," the statement said.

HDW pulls out of sub deal
German shipbuilding group HDW has pulled out of a subcontractor deal to build two submarines at an Arab-owned shipyard in Greece, the Greek defense minister said on 16 May. HDW bowed out due to "major disagreements" on broader project cooperation in Germany between its parent company ThyssenKrupp Marine Systems and Abu Dhabi Mar, the new owners of Hellenic Shipyards that were to handle the submarine contract. The dispute concerns the building of two new 214-class submarines and the overhaul of an older 209-class submarine, Venizelos said in a statement. However, it does not affect the delivery of three more 214-class submarines that have been completed at Hellenic Shipyards, the country's main shipbuilding facility, the minister said.

Japan could delay U.S. base closure
Japan's defense minister suggested on 19 May that the country could agree to a delay of the 2014 deadline for relocating an unpopular U.S. military base on the island of Okinawa, Jiji Press reported.

MantaRay provides air-independent propulsion for UUVs



Cyclone Power Technologies Inc., developer of the all-fuel, clean-tech Cyclone Engine, announced that Raytheon Integrated Defense Systems (IDS), a business of Raytheon Company, has placed an initial purchase order for multiple engines from Cyclone. This contract is valued at approximately $400,000. The work will be performed at Cyclone's facility in Florida.

"We are designing and building engines such as the MantaRay for Raytheon and their customers and starting to generate revenue from these operations. We're very pleased to be working alongside such a well established and respected company and look forward to building our relations going forward."

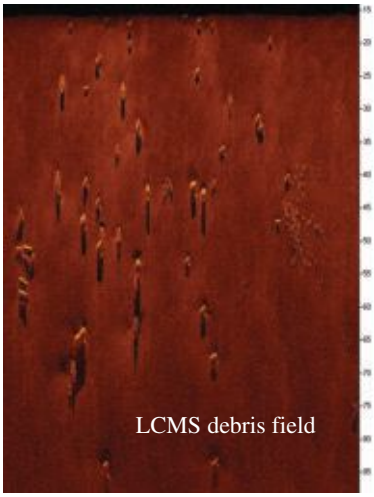
These initial purchased engines, named the MantaRay, are based on the company's Mark V engine and patented technology. The MantaRay represents one of several engine models and projects on which Cyclone and Raytheon are collaborating.

"After months of rigorous engine testing, we're pleased to say that Cyclone and Raytheon are now entering the next phase of our working relationship," stated Harry Schoell, CEO of Cyclone. "We are designing and building engines, such as the MantaRay for Raytheon and their customers, and starting to generate revenue from these operations."

Cyclone told ON&T that the engines would be used aboard UUVs and powered by a proprietary fuel called "Moden" and do not require air to operate — a kind of air-independent propulsion (AIP) system

Invented by company founder and CEO, Harry Schoell, the patented Cyclone Engine is an eco-friendly external combustion engine, ingeniously designed to achieve high thermal efficiencies through a compact heat-regenerative process, and to run on virtually any fuel. The Cyclone Engine was recognized by Popular Science Magazine as the Invention of the Year for 2008 and was presented with the Society of Automotive Engineers' AEI Tech Award in 2006 and 2008. Additionally, Cyclone was recently named Environmental Business of the Year by the Broward County Environmental Protection Department.

For more information, visit www.cyclonepower.com.



EdgeTech to conduct demos of new LMC sonar in July

EdgeTech, a leader in sonar imaging systems, will be conducting on-water demonstrations of the new Littoral Mine Countermeasure Sonar (LMCS) in Boca Raton, Florida 18 to 22 July. This event is focused on the military community and will highlight the latest EdgeTech LMCS solution. The system includes a unique suite of integrated vehicle, sonar, and software technology that provides high speed, high resolution, and long range underwater imaging.

Confirming reservations are required. Please contact Rick Babicz at babicz@edgetech.com or +1 508-356-9741.

Acoustic Device Countermeasure (ADC) MK 5 subcontract awarded to Bluefin Robotics

Bluefin Robotics is being awarded a subcontract from Ultra Electronics Ocean Systems, Inc., a world leader in expendable acoustic countermeasures for submarines and surface ships. Bluefin will support Ultra in the development, design, fabrication, integration, and testing of the acoustic device countermeasure (ADC) MK 5, with a particular responsibility of providing the mobility subsystem. The ADC will be an acoustic torpedo countermeasure with advanced features that can be employed either as a static or mobile device. It will replace the legacy MK 2 and MK 3 torpedo countermeasures and improve the defense of Navy submarines against acoustic homing torpedoes.

The ADC MK 5 program marks an expansion of the Bluefin product line, which currently includes five different AUV models. The company will draw from already proven technology used in their larger AUVs to develop the 3-in. diameter, low-cost, expendable device. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

For more information, visit www.bluefinrobotics.com.

U.S. Navy recruits gamers to help in piracy strategy

The U.S. Navy is turning to the wisdom of the crowd to forge military strategy, inviting the public to join an online game in which Somali pirates have hijacked commercial ships.

The Office of Naval Research plans this month to launch the U.S. military's first online war game to draw on the ideas of thousands of people instead of the traditional strategy session held inside the Pentagon's offices.

The approach "is designed to produce ideas and potential solutions to our toughest problems and challenges," Lawrence Schuette, director of innovation at Office of Naval Research, told AFP.

The scheduled starting date for the project had to be delayed by a month as about 9,000 people have signed up, instead of the 1,000 that planners expected, officials said.

The Navy hopes the project will take advantage of a wide range of expertise, not only from military officers, but also academics, politicians, and technology specialists, he said.

The game will have three rounds over three weeks, with players in the first stage faced with a piracy scenario and asked to propose brief, Twitter-length solutions. Players will be presented with boxes labeled, "Innovate" and "Defend," with questions such as: What new resources could turn the tide in the Somali pirate situation? In the second round, there are more scenarios to grapple with and then in the third, players are grouped in teams and will come up with a more detailed action plan.

The precise details of the war game scenarios are being kept under wraps for the moment by the game designers, the Institute for the Future, a non-profit group based in Palo Alto, California.

The gaming platform is called the Massively Multiplayer Online Wargame Leveraging the Internet, or MMOWGLI.

Royal Navy picks new reactor

Britain will use a new nuclear reactor design to power the Royal Navy's next generation of ballistic missile submarines, said government officials, who also announced the launch of the assessment phase of the Successor program.

The overall cost of the program to build three or four submarines to replace the existing Vanguard class of boats starting in 2028 could be as much as 25 billion pounds ($40.4 billion). Unlike previous estimates, which have been given in 2006/2007 pounds, the new figure is the out-turn price: the predicted sum of spending in current units.

The nuclear submarines will incorporate a new power plant known as Pressurized Water Reactor 3. The new reactor offers better safety and more through-life efficiencies, although at a higher initial cost: about 50 million pounds per submarine, said a report released 18 May updating Parliament on the program.

The report to parliament said the MoD would spend 3 billion pounds on design work and order long-lead production items for the first three submarines.

A decision on whether to build a fourth boat will be delayed until the main development-and-manufacture phase, scheduled to begin in 2016.

Army transfers JHSVs to Navy

The Department of the Navy signed a Memorandum of Agreement (MOA) 2 May with the Department of the Army transferring all five of the Army's Joint High Speed Vessels (JHSV) to the Navy.

The intent of this MOA is to clarify relationships, identify the roles and responsibilities, and provide an implementation plan. In addition, this MOA formalizes and delineates the management, leadership, and requirements sponsorship roles required to deliver the capability encompassed by the JHSV to the combatant commanders.

"This agreement with the Army demonstrates our commitment to reducing redundancies and saving money for the taxpayer," said Secretary of the Navy Ray Mabus. "This is a responsible step that will ensure our military remains the most formidable fighting force the world has ever known."

Initially, the JHSV program was envisioned to have five of the first 10 JHSVs assigned to the Army and the remainder to the Navy. However, at the Army/Navy Warfighter Talks in December 2010, both services agreed to transfer the Army's five JHSVs upon signing of this MOA; all 10 JHSVs will now be assigned to Navy.

"The transfer of the JHSV is about aligning our core competencies, while at the same time realizing a measure of managerial efficiency," said Army Secretary John McHugh. "We look forward to continued cooperation with the Navy as we determine how to ensure this capability can best support the combatant commanders."

The Military Sealift Command will crew the JHSVs with civilian mariners or contract mariners. Joint High Speed Vessels will be used for fast intra-theater transportation of troops, military vehicles and equipment.

Tidal Systems Challenge - Blade Design!

By Dan White

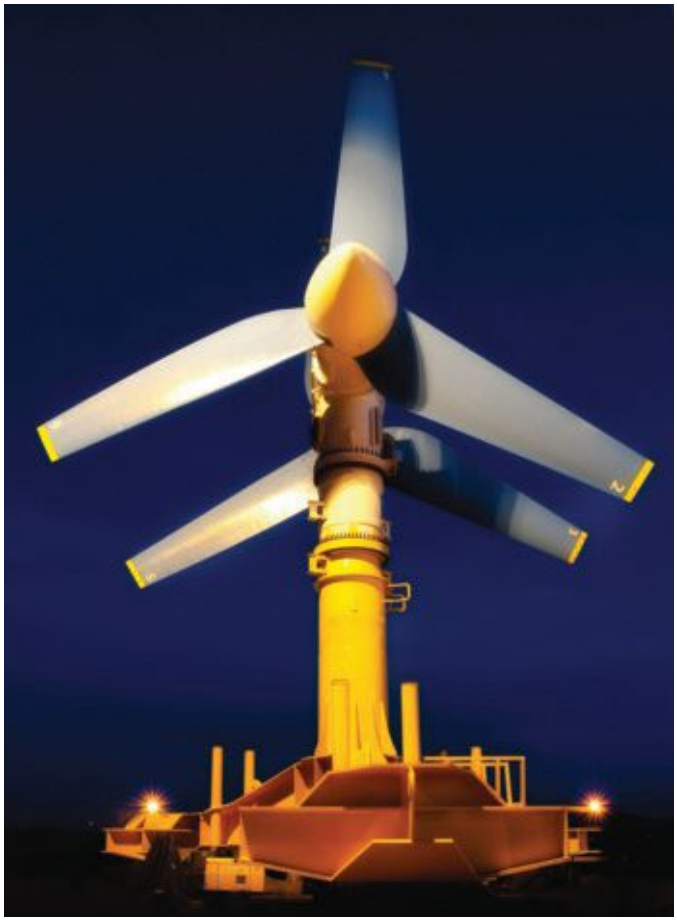
In the world of tidal turbines, the story remains to be "blade design." Essentially, every turbine that has been put in the water has experience a blade failure. This has something to do with simple physics. The force on the blade is proportional to the density of the medium times the velocity. Water is about 784 times as dense as air. Put a blade in the water in a 5 knot current and you generate a tremendous force on the blade.

Examples are the Atlantis Resources AR1000 turbine and the Verdant Power Turbine. Both underwent testing in the ocean, and both experienced blade failures even though the two systems differ in size in a big way.

The Atlantis Resources AR1000™

Atlantis Resources Corporation ("Atlantis"), one of the world's leading developers of electricity-generating tidal current turbines, unveiled the largest and most powerful tidal power turbine ever built, the AK1000™ in August 2010 at Invergordon, Scotland. The AK1000™ is due for installation at a dedicated berth at the European Marine Energy Centre ("EMEC"), located in Orkney, Scotland later this summer.

Producing 1MW of predictable power at a water velocity of 2.65m/s, the AK1000™ is capable of generating enough electricity for over 1,000 homes. It is designed for harsh weather and rough, open ocean environments such as those found off the



Scottish coast. The turbine incorporates cutting edge technology from suppliers across the globe, has an 18m rotor diameter, weighs 1300 tonnes and stands at a height of 22.5m. The giant turbine is expected to be environmentally benign due to a low rotation speed whilst in operation and will deliver predictable, sustainable power on its subsea berth, in 35m of water at the European Marine Energy Centre in Orkney, Scotland.

Shortly after installation at EMEC, the AR1000 experienced failure of the experimental composite blades due to a manufacturing fault. Following a tender process, a contract to manufacture standard GRP blades for the AK1000™ test turbine has been awarded to Norco GRP Ltd, a specialist in glass-reinforced plastic based in Poole, Dorset. The design and manufacturing process used for the new blades is being reviewed by Det Norske Veritas, who will also be involved in the manufacturing quality assessment prior to delivery.

Investigations have confirmed that the fault with the original blades related to the composite material used during their fabrication and that the faulty composite parted from the blade structure, which remained fully intact. The turbine was successfully retrieved in November 2010 and redeployed in May 2011.

Atlantis CEO Timothy Cornelius told ON&T that the turbine has been installed on the gravity base structure twice now (at EMEC) in under 90 minutes, "proving that full-scale tidal turbines can be installed and retrieved quickly and efficiently in exposed offshore locations."

The Future

The Indian state of Gujarat is planning to host Asia's first commercial-scale tidal power station. Atlantis Resources is to install a 50MW tidal farm in the Gulf of Kutch on India's west coast, with construction starting early in 2012. The facility could be expanded to deliver more than 200MW.

The biggest operating tidal station in the world, La Rance in France, generates 240MW, while South Korea is planning several large facilities. To claim the title of "Asia's first," the Indian project will have to outrun developments at Sihwa Lake, a South Korean tidal barrage under construction on the country's west coast. China and other parts of India are also seen as productive areas in the near future.

Projections indicate that the cost of the initial 50MW farm — to consist of 50 1MW turbines — will come in at about $150 million.

As much of the manufacturing as possible will take place in Gujarat, taking advantage of the skills base in India's booming wind turbine industry.

In October 2010, a consortium including Atlantis was given the right to develop a tidal farm involving about 400 turbines in the Pentland Firth in Scotland, which, as things stand, would be the world's biggest — although South Korea's proposed Incheon barrage would come in at over 1GW.

Verdant Power's Free Flow System

In 2006, two tidal turbines were installed by Verdant Power, a startup tidal power venture, in New York's East River. The goal was that these tidal turbines and others eventually deployed in a grid would supply enough energy to power a local supermarket and parking garage. Unfortunately, when the turbine experienced higher than expected currents, the turbines suffered blade failure within 1-day of installation. Upon examination of the turbine's design, the blade failed at the root where the maximum moment was applied to the blade structure. The principle design flaw of the failed tidal turbine was that all of the stresses in the blade were concentrated at the connection between the blades and the hub, causing the blades to shear off.

The Verdant Power example points out that one of the major difficulties in tidal turbine design is the hub-blade connection. Composite materials are most commonly used to manufacture turbine blades, due to their low weight, high stiffness, and resistance to corrosion. However, use of such materials then creates the problem of connecting them to the turbine hub. Metal blades can be welded directly to the hub, but they are much heavier and prone to corrosion. A composite material must be connected in a different manner to a metal hub. Connecting the composite blades to the hub can be a major challenge, as they must transfer the load gradually so as not to shear off.

A comprehensive blade design study was undertaken called Computer Modeling and Analysis of Tidal Turbine Hub-Blade Designs, Crosby Laboratory The University of Maine Orono, ME 04469, April 22, 2009 and lists the conclusions for the future blade designs.

The Future

On 3 May 2011, the U.S. Federal Energy Regulatory Commission (FERC) recommended licensing Verdant Power's Roosevelt Island Tidal Energy (RITE) Project, proposed for installation in the East Channel of the East River in New York City. The proposed RITE Project would use the natural tidal currents of the East River to generate up to 1 MW of emission-free electricity via turbine generator units anchored on the riverbed. Verdant Power has proposed a three-phased development approach for the RITE Project, beginning in 2012. The pilot project is estimated to have an annual generation of 2.40 GWh after the completion of Phase 3. Verdant Power would install its 5th Generation Free Flow System through the proposed pilot project, an updated version of the technology previously demonstrated in the East River.

Verdant Power submitted its license application under FERC's newly established Hydrokinetic Pilot Project Licensing Procedures, developed to allow for the advancement of U.S. hydrokinetic technologies (tidal, river, wave power), while maintaining FERC oversight and agency input. FERC's recommendation to license the project was based on its analysis of a variety of environmental and recreational monitoring measures proposed by Verdant Power and also included four additional staff modifications. If approved, the RITE Project would be the first tidal power plant licensed to transmit energy onto the national grid.

According to the Ocean Renewable Energy Coalition (OREC), the leading trade organization for the US marine and hydrokinetic energy industry, the potential for such projects is up to 3,000MW of installed capacity by 2025 — enough to power more than three million homes. The Ocean Energy Council (OEC) estimates the global potential for tidal power exceeds 63,000MW.

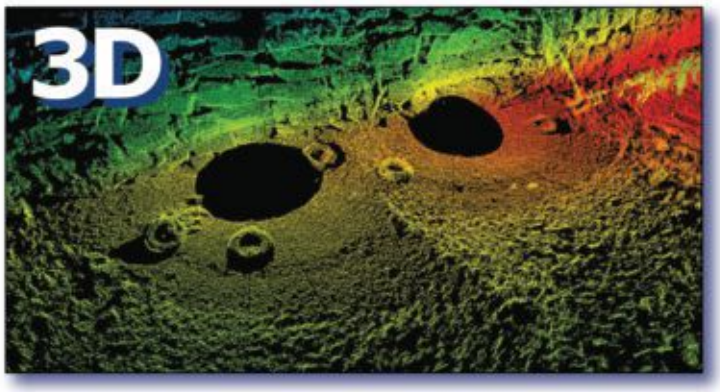
Verdant Power's RITE Project was initiated in 2002 with prototype system testing. During 2006 to 2008, Verdant Power demonstrated a full-scale, grid-connected Free Flow System at the project, successfully delivering energy to operating businesses in New York City. This effort represented the world's first grid-connected array of tidal energy turbines. Verdant Power also conducted environmental monitoring of the Free Flow System during the RITE demonstration, developing significant environmental data that showed no evidence of increased fish injury or mortality. Since its inception, the RITE Project has received major support from the New York State Energy Research and Development Authority (NYSERDA), as well as the New York City Economic Development Corporation and the US Department of Energy.

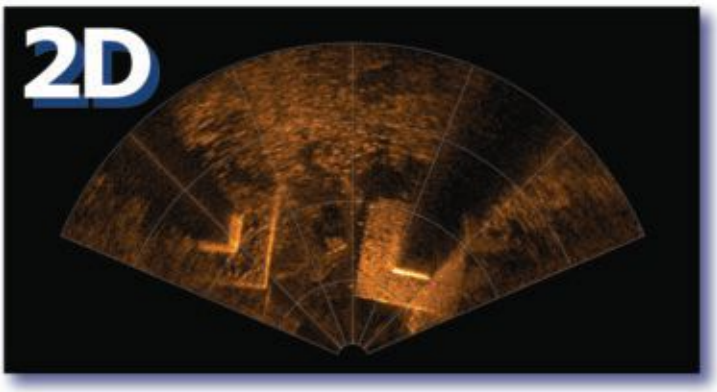
The China Energy Conservation Environment Protection Group (CECEP), China's leading renewable energy company, and Verdant Power, Inc., the leading U.S. tidal power developer, signed a Memorandum of Understanding (MOU) to develop tidal energy power projects in China. The MOU is the first of its kind between China and the U.S. involving marine and hydrokinetic power projects.

"Marine kinetic hydropower is an energy resource that is greatly underused — but which must play a greater role in the future if 'sustainable hydropower' is to be achieved," stated Ronald Smith, CEO of Verdant Power. "This historic signing is a significant first step for both countries in the collaborative development of this type of renewable energy."

The MOU establishes tidal and river power devices as a new stream of U.S. exports to international markets. It will also spur economic development and job growth in the U.S. and build momentum for a domestic tidal energy market.

Your Challenges, Our Solutions.





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OFFSHORE INDUSTRY

President Obama's new plan calls for lease extensions in U.S. Gulf

President Obama used his weekly address to tout steps aimed at accelerating oil drilling, including a task force to expedite permitting for projects off Alaska's coast; annual lease sales in Alaska's onshore National Petroleum Reserve; and extension of leases in the Gulf of Mexico and off Alaska's coast that were affected by restrictions imposed after the BP oil spill.

The U.S. House already has passed a trio of bills that would mandate a major expansion of offshore drilling and set firm deadlines for the Interior Department to act on offshore drilling permit requests.

Deepwater Gulf production won't hit pre-spill levels for years: report

Deepwater oil and gas production in the Gulf of Mexico will drop sharply this year and isn't expected to reach levels seen before the BP oil spill until 2016, the industry consulting firm Wood Mackenzie concludes in a new report.

The report tracks the impact of the April 2010 Macondo well blowout that prompted a months-long freeze on deepwater drilling and a wave of new permitting and rig safety requirements.

"Given our current permitting outlook, deepwater GoM production is not expected to exceed pre-Macondo estimates until 2016, when a new peak of nearly 2 million barrels of oil equivalent is anticipated," the report states.

Wood Mackenzie estimates that deepwater production will drop by about 375,000 barrels of oil equivalent per day this year, a reduction of 20% from pre-spill production estimates.

ExxonMobil's approach to develop Angola deepwater projects honored

The Offshore Technology Conference (OTC) presented ExxonMobil Development Co. with a special citation for the development and implementation of the "design one, build multiple" strategy that successfully delivered large-scale deepwater projects offshore Angola on Block 15 that achieved peak production of over 700,000 barrels of oil per day.

The projects in Block 15, about 90 miles off the coast of Angola, established industry benchmarks for completion time and unit development costs for deepwater projects of their size and complexity. To date, over one billion of the five billion barrels discovered on the block have been produced. Current production is approximately 500,000 barrels per day.

Industry expected to dole out $44.5B on FPSs through 2015

The international oil and gas industry is expected to invest $44.5 billion on floating production systems (FPS) in 2010 to 2015, according to industry projections. Of the 200 FPSs planned for construction in this timeframe, 67 are expected to be installed in deepwater. The ultra-deepwater segment would have 30 FPS units installed in water more than 4,920-ft. deep. "Prospects are bright, but challenges are plenty," said Christopher M. Barton, McDermott Asia Pacific Pte. Ltd.'s vice president for business acquisition in the region.

Record natural gas demand boosts prospects for future robust growth

According to the U.S. Department of Energy (DOE), Energy Information Administration, the total of more than 22.1 trillion cubic feet of natural gas demand in 2010 was the highest-ever level in the United States, exceeding the previous high point established in 2000 by more than 10%.

Future growth in demand is expected to be led by the power generation sector, where natural gas is poised to help offset an expected wave of older coal-fired power plant retirements across the country. Power generation demand in 2010 was at an all-time high, 40% higher than demand in 2000. Industrial demand also bounced back sharply from pre-recession levels.

The natural gas industry is also experiencing growth in residential and commercial market sectors. In 2010, residential natural gas demand was the highest since 2003, while commercial customers used more gas than at any time since 1997. While muted by appliance and building energy efficiency improvements, natural gas is well positioned to continue to efficiently meet building energy needs as an environmentally friendly energy source.

Bromwich at OTC 2011: Feds plan to regulate offshore contractors

The federal government will expand its oversight of coastal drilling to include new regulation of oilfield service firms, rig suppliers, and other offshore contractors, a top Obama administration official said.

Michael Bromwich, the head of the Bureau of Ocean Energy Management, Regulation and Enforcement, said a broad internal review of current laws concluded that the agency has "broad legal authority over all activities relating to offshore leases, whether it is engaged in by lessees, operators, or contractors."

"We can exercise such authority as we deem appropriate," Bromwich told the Offshore Technology Conference (OTC) in Houston.

Bromwich has floated the idea of expanding the ocean energy Bureau's reach beyond oil and gas companies before. But, he had been unsure whether the move would require Congress to go along with the plan. According to the administration's internal legal review, congressional action isn't necessary; the agency already has the authority.

Historically, the federal offshore energy agency — previously known as the Minerals Management Service — has focused on leaseholders and operators. Other federal agencies, such as the Coast Guard, separately regulate entities such as drilling rigs and their owners. The benefit of the traditional system, Bromwich acknowledged, is that "it served to preserve clarity and the singular responsibility of the operator."

But, the drilling chief said that he was "convinced that we can fully preserve the principle of holding operators fully responsible — and, in most cases ,solely responsible — without sacrificing the ability to pursue regulatory actions against contractors for serious violations of agency rules and regulations."

Bromwich insisted the Obama administration would be "careful and measured in extending our regulatory authority to contractors."

Statoil to award contract for new category of rig for Norwegian shelf

Statoil told the Offshore Technology Conference (OTC) that it expects to award a contract for construction of a new category of drilling rig during the third quarter of 2011. Statoil also said it has reserved construction slots at four different yards it says are capable of delivering the rig in the second half of 2014.

The semi-submersible rig design, called Cat D, targets drilling only in mid-depth waters and meets the realities of operations on the Norwegian continental shelf. Capable of drilling to 27,887-ft. in 4,265-ft. of water, the Cat D rig will target mature fields offshore Norway with an eye toward operating at a 20% greater efficiency than rigs currently used in the area. The rig also will be standardized to fit into Statoil's fast-track delivery system.

Jon Arnt Jacobsen, Statoil's procurement officer, said the new design was necessary to fit the Norwegian continental shelf niche. In addition, he pointed out that about 65% of the rigs on the Norwegian shelf were at least 25 years old and that bringing them up to the standards needed for the work is becoming increasingly expensive.

Seismic vessels to increase in 2011 over 2010: Offshore survey

Offshore's seismic vessel survey for 2011 shows both new vessels and some additional players. These combine to push the total number of these vessels higher than in 2010. The tally of vessels is 163. This compares to 156 in 2010. This increase of seven also counts of new-builds contracted for delivery but not yet in service.

The new vessels show a built-for-purpose trend in that many are being specified and outfitted for particular types of surveys, such as 4D and ocean-bottom node applications.

While the onshore excitement surrounding tight gas and shale plays has shifted some of the geophysical attention away from offshore, there remain indications of some significant trends in subsea survey technology, Offshore said, adding that when some of these will become broadly operational is anyone's guess, "but the industry has a way of accelerating when the price is right."

These trends take two directions: one is the traditional hardware and processing advances year over year; the other involves a completely new approach to geology and geophysics.

Some recent hardware and field-oriented advances are already in practice.

The seismic vessel Geo Challenger

Methods of running surveys such as WesternGeco's coil vessel track are out of the trial phase and making an impact in everyday work. OBC and 4D are in the mainstream now. Visualization in three dimensions is no longer a novelty. Processing power continues to increase and also to become desktop friendly.

New database identifies more than 300 subsea projects

New data collection reports more than 300 subsea projects either under way or planned globally, which will require more than 1,300 subsea trees, 110 manifolds, and 7,456-mi. of subsea umbilicals, risers, and flowlines.

The contracts database reveals that more than 100 major subsea contracts totaling over $7.4 billion have been awarded globally during the first 4 months of 2011. These include 23 EPIC, 33 manufacturing, and 13 installation contracts. This new database is available from the Subsea UK organization to its members.

"This is the first time that all of this publicly-released information has been available through one source and will provide valuable key facts and figures for business development," said Alistair Birnie, Subsea UK's chief executive officer.

Information provided in the projects database includes the name of the project, the operator, main contractor, and equipment suppliers along with the project status, where it is located, water depths, and as the current number of trees, manifolds, umbilicals, flowlines and risers currently in use and required in the future to meet demand. The database also holds information on FPSOs and subsea vessels.

OTC 2011: Energy industry said to have abundance of job openings

The oil and gas sector is suddenly adding jobs in droves, as high oil prices and the economic recovery provide fresh incentive to pursue new projects from Texas to Iraq, according to industry recruiters who converged on Houston in early May for the 2011 Offshore Technology Conference (OTC). The hunt for talent are major oil companies as well as lesser-known engineering firms in a sweeping effort that recalls previous boom cycles and is likely to bring more jobs to Houston.

Job search site Oilcareers.com noted that almost 12,500 new vacancies were posted in March, 60% more than a year ago. And online applications doubled. Still, U.S. unemployment remained near 9%.

In recent months, optimism began returning to the industry as oil prices gave companies confidence to green-light new projects.

Bristow renews contract award for large helicopters in Norway

Bristow Group Inc., a leading provider of helicopter services to the offshore energy industry, was awarded a renewal contract for work in Norway valued in excess of $167 million in revenue.

"Our recent success in renewing this long-term contract with a key customer reinforces our long-term commitment to the Norwegian market," said William E. Chiles, Bristow's president and chief executive officer.

The existing 5-year contract was extended after a bid competition for another 5-year term, which commences in early 2013, with the option to extend it for an additional three periods of 1-year each. Bristow will provide two dedicated Sikorsky S-92 large helicopters operating from our Sola base in Stavanger, Norway beginning in March 2013.

Federal judge orders action on six Gulf of Mexico deepwater permits

U.S. District Judge Martin Feldman gave the Obama administration 30 days to act on six permits for deepwater drilling in the Gulf of Mexico.

Feldman issued the order 10 May in a lawsuit filed by Ensco Offshore Co. and others. He rejected Interior Department arguments that the issue was moot because it already has resumed issuing permits following the moratorium that was imposed last year after the BP oil spill.

Three permit applications at issue in the original lawsuit have been granted. But Feldman said the government's issuing of what he called "a scant few applications" does not provide the certainty Ensco needs to conduct its business in the Gulf. He said the law required the six remaining Ensco-related applications to be acted on within a reasonable period.

Fed's draft supplemental EIS for Western Gulf Sale 218 completed

The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) completed a draft supplemental environmental impact statement (SEIS) for proposed oil and gas Lease Sale 218 in the Western Planning Area in the Gulf of Mexico. This draft SEIS updates the findings in several previously published EISs covering the U.S. Gulf as well provides as new analyses using the latest available information following the Deepwater Horizon explosion and oil spill.

"The analyses published in this SEIS will allow us to make objective, science-based decisions about the activities involved in offshore energy exploration, development, and production," BOEMRE director Michael R. Bromwich said.

Two public hearings were held on the SEIS in May. Comments will be used to prepare the Final SEIS for Sale 218.

U.S. oil and gas industry supports 9.2 million jobs, 7.7% of economy

The U.S. oil and natural gas industry supports 9.2 million American jobs and 7.7% of the U.S. economy, according to a new study commissioned by the American Petroleum Institute (API) and conducted by PricewaterhouseCoopers LLP.

The new report updates data from a previous report and shows that, between 2007 and 2009, the economic activity supported by the industry actually increased in size as a percentage of U.S. GDP, from 7.5 to 7.7%.

"The people of the U.S. oil and natural gas industry are the backbone of our economy," said Jack Gerard, API president and chief executive officer. "They provide most of the nation's energy, spurring job growth across America. Even during times of economic recession, the oil and natural gas industry stands strong."

The economic impact of the oil and natural gas industry reaches all 50 states and the District of Columbia, according to the study. The top 15 states in percentage of jobs supported by the industry in 2009 were Wyoming, Louisiana, Texas, Oklahoma, Alaska, North Dakota, New Mexico, West Virginia, Delaware, Kansas, Montana, Mississippi, Colorado, Arkansas, and Utah.

Vantage Drilling Co. places order for ultra-deepwater drillship

Vantage Drilling Co. has entered into an agreement with Daewoo Shipbuilding and Marine Engineering Co., Ltd. to construct an ultra-deepwater drillship, further expanding the company's ultra-deepwater drilling fleet. The company plans to name the drillship Tungsten Explorer.

The agreement is a fixed-price turnkey contract for the construction of the drillship with a scheduled delivery date of 31 May 2013. The cost of the Tungsten Explorer is estimated to be approximately $580 to $590 million. The company also has obtained a fixed-price option for the purchase of an additional drillship.

Tungsten Explorer will be constructed at DSME's shipyard in Okpo, Korea and will be capable of operating in water depths up to 12,000-ft., with a total vertical drilling depth capacity of 40,000-ft. The hull design has a variable deck load of 20,000 tons and measures 781-ft. long by 137-ft. wide. The drillship will be equipped with the most technically advanced features in the drilling industry including DP3 dynamic positioning system, 1,250 short-ton hook load drilling package, a 9,000 hp drawworks, offline pipe handling, and a trip saver system. The drillship will have accommodations for 200 personnel.

USGS sees 18-32 tcf recoverable natural gas in NPR-Alaska

An updated economic analysis indicates that 18tcf of undiscovered gas are economically recoverable from the National Petroleum Reserve in Alaska and adjacent waters when the market price is $8/Mcf or more and 32tcf is economically recoverable at $10/Mcf or more if a pipeline were built.

The same analysis found that 273 million barrels of undiscovered oil are economically recoverable at $72/barrel, and 500 million barrels are economically recoverable at $90/barrel. The estimates are based on mean undiscovered resources and don't include the discovered but undeveloped oil accumulations in the northeastern NPRA.

The U.S. Geological Survey (USGS) economic analysis is based on a 2010 USGS resource assessment that determined how much undiscovered, conventional oil and gas in the NPRA is technically recoverable. These reports provide updates from the USGS 2003 economic analysis and 2002 resource assessment of the NPRA.

The USGS said the economically recoverable oil estimates are dependent upon gas exploration in the NPRA, meaning that it is assumed the oil would be found in the process of looking primarily for gas.

No pipeline exists to transport gas from the Alaska North Slope, so the assessment assumes a 10 to 20-year delay between discovery and production in the NPRA.

High-pressure deepwater well capping stack unveiled at OTC

The Helix Well Containment Group's new deepwater well capping stack was unveiled in early May at the OTC in Houston. The new capping stack can handle pressures of up to 15,000 pounds per square inch, an improvement over the 10,000 psi model Helix completed in February.

The Helix group is a cooperative effort of 24 U.S. Gulf oil companies. They have banded together and invested in spill-response technology to convince the federal government that they could return to drilling in deep water and stop a leak like last year's BP disaster, in which the massive device known as a blowout preventer (BOP) failed to close in the well.

Helix participating companies succeeded in getting several new wells approved in recent months, mostly because they had access to the consortium's capping stack, something like a mini-BOP that could attach to the top of a failed BOP.

Like the 10,000 psi model that was unveiled in late February — and led to the first new deepwater well permit approval a day later — the new capping stack will be housed in North Houston and can be at the site of a blowout offshore in less than 48 hours, according to Helix Well Containment Group.

The consortium's well containment plan states that if there's no debris blocking the well bore, the stack can be attached and shut off flow in 3 to 4 days. But other complications could delay final closure. If the capping stack is not enough to stop all flow and containment vessels and systems are necessary to carry oil to the surface, it could take as long as 17 days, a consortium spokeswoman said. The second capping stack weighs 156,000 lb.

Subsea 7 wins $70M Norske Shell contract
Subsea 7 has secured an order from Norske Shell to provide pipeline installation services for the Ormen Lange northern field development, Mid North Project in the Norwegian Sea. The $70 million contract is part of the company's agreement with Shell, signed in September 2010, for a pipeline installation in the North Sea region. The project will be developed with a new subsea template located approximately 6km north of the existing subsea facilities on Ormen Lange in a water depth of 900m, and will be tied back to Ormen Lange by two 12-in. production pipelines, a 6-in. service pipeline and a control umbilical. Under the contract, Subsea 7 will fabricate and install the pipelines and the control umbilical and will also be responsible for all subsea connections and pre-commissioning activities on the new pipelines. Subsea 7's reeled pipelay vessels will be used for the pipelay operations, which will commence in early 2012.

FMC Technologies awarded Hibernia contract
FMC Technologies, Inc. signed an agreement with Hibernia Management and Development Co. Ltd. to manufacture and supply subsea systems for the Hibernia Southern Extension Project. The Hibernia Southern Extension Project is an expansion of the Hibernia field, located on the Grand Banks approximately 200 miles southeast of St. John's, Newfoundland and Labrador. FMC's scope of supply includes provision for up to six subsea injection trees and wellheads, one manifold, and associated control systems. All equipment will be manufactured at FMC's St. John's and Houston operations. Deliveries will commence in the second quarter of 2013.

SBM to supply loading system and design rigs
SBM Offshore has secured contracts worth $250 million to supply an oil loading system and design drilling ships and jack-ups. Work under the first contract includes the engineering, procurement, and supply of oil offloading lines and fiber optic cables to be suspended between an FPSO and its deepwater export buoy. SBM will secure design license fees from Hyundai Heavy Industries, which will construct and deliver six GustoMSC P10,000-class drillships. The company will also receive design licence fees from Singapore's Keppel Fels and Jurong shipyards, which have signed contracts to construct and deliver three GustoMSC CJ70-class cantilever drilling jack-ups with international drilling contractors. SBM has also received contracts to supply associated equipment for the jack-ups.

Technip, BP sign agreement for spar platforms
Technip has signed a 10-year agreement with BP Exploration and Production to design and construct hulls and mooring systems for spar platforms that will be located in the Gulf of Mexico. Under the agreement, Technip will also design tension risers for dry tree units. Technip was to begin the front-end engineering design for this project in the second quarter of 2011.

Jack, St. Malo fabrication, installation project goes to McDermott International

The subsea construction vessel North Ocean 102 (NO102)

McDermott International, Inc. said one of its subsidiary companies was awarded fabrication and installation work from Chevron USA Inc. to support the development of the Jack and St. Malo fields in ultra-deepwater Gulf of Mexico. The project was included in McDermott's first quarter 2011 bookings.

Work will begin in 2013, with the start of fabrication of 21 rigid jumpers at McDermott's Morgan City fabrication facility in Louisiana. Offshore installation will begin in early 2014 using McDermott's subsea construction vessel North Ocean 102 (NO102) and the DB16.

"We ... believe that our combined solution of NO102's high payload and top tension capacity coupled with our ability to fabricate the high spec jumpers in house provides a unique benefit for this project's delivery," said Stephen M. Johnson, president and chief executive officer of McDermott.

The NO102 and its crew will transport and install more than 60 miles of umbilicals, including three control and two power umbilicals. The jumpers and remaining subsea controls system components, including more than 80 flying leads, will be installed by the DB16. Located in up to 7,150-ft. of water in Walker Ridge lease blocks, the Jack South and St. Malo North and South subsea drill centers tie back to the Jack and St. Malo floating production platform, McDermott said.

The 427-ft. NO102 enables McDermott to offer versatile installation capabilities in the flexible pipe and product market worldwide. The vessel has two cranes and a moon pool to support deepwater subsea construction work and has a fast transit speed. It is currently equipped with a 7,000-ton capacity cable and umbilical and flexible pipe carousel with horizontal lay system. Plans are underway to upgrade the vessel's capability by installing a high-capacity flexible-lay system for ultra-deepwater installation work. The upgrade will include installation of a new 250-ton crane.

Meanwhile, KBR was awarded a contract by Chevron to execute detailed design engineering for the Jack and St. Malo floating production unit (FPU). KBR will provide design and engineering support through fabrication for the deep draft semi-submersible, including hull, deck box, accommodations, appurtenances, equipment foundations, mooring system design, and anchor suction piles. The semi-submersible will be designed to minimize vessel motion.

Signet Maritime vessels complete Gulf rig moves

Signet Maritime Corp. disclosed the successful completion of transportation, delivery, and loadout of two mat-supported jack-up rigs. Signet said it provided full turnkey operations for the movement of the Rubicone H-191 from Sabine, Texas to Kiewit Offshore Services, Ingleside, Texas.

The M/V Signet Enterprise, with 4,400BHP, 62.6MT Bollard pull ahead, and 53.5MT bollard pull astern, and the M/V Signet Intrepid, with 4,400BHP, 60.3MT bollard pull ahead, 54.7MT bollard pull astern, were the primary towing tugs for the project.

Signet said the ocean tow was accomplished flawlessly in four days. "The towing speed at 3.8 knots was excellent given the time of year and sea conditions," commented Jackie Yardley, Signet Maritime's senior manager of global traffic and rig transport.

Complete marine services were also provided for the movement and delivery of the Veer Prem mat supported jack-up rig, from Galveston, Texas to Kiewit Offshore Services at Ingleside. Signet once again deployed its flagship vessels, the Signet Enterprise and Signet Intrepid Signet, along with the support tail boat M/V Santa Rosa.

Upon arrival at the Aransas Sea Buoy, Signet utilized additional vessels from its fleet to provide inbound assistance and loadout services onto the heavy lift vessel (HLV) at Kiewit Offshore Services for both transportation projects. Once the rig arrived at the Aransas Sea Buoy, two additional Signet tugs, M/V Signet Challenger and M/V Signet Volunteer, arrived to assist the rig to Kiewit.

After delivery of Rubicone to Kiewit, Signet provided M/V Signet Columbia and M/V Signet Freedom in conjunction with the four Signet ASD's to load the rig onto the HLV. As an integral part of the work scope, upon completion of loadout, Signet provided cribbing and sea-fastening for Veer Prem, as well as the necessary support tugs to escort the loaded HLV to sea.

Major Project Risk Assessment and constant direct weather forecasting were provided throughout the duration of both projects.

Closer to solving one of industry's big headaches

Completions and sand control specialist Darcy said it has successfully crossed another milestone in its development of the critical matrix management technology. This technology provides a low risk, high-value sand management completions method for optimizing oil and gas reservoir inflow.

Chief executive Steve Bruce

Sand produced during hydrocarbon production poses a significant threat to productivity, asset integrity, hydrocarbon control, and ultimately, reservoir recovery factors. As a result, sand management techniques that consider geo-mechanical yielding and compaction is crucial to operators, especially in deepwater projects.

In preparation for the full-scale deployment of its revolutionary sand management system, Darcy has completed an operator-sponsored project to demonstrate the performance characteristics of the new system. An independently verified test rig was built to replicate the harsh production conditions and simulate the geo-technical loading that could be experienced downhole due to sand laminates and shale stress conditions. The testing sequence also included tests to determine the sand retention thresholds while the Darcy system was subjected to excessive loading and circulation rates.

Testing previously performed by Darcy had already highlighted the fact that the screen system shows superior mechanical strength properties over that of current forms of compliant or non-compliant sand control technology, in particular those that yield base pipe as the expansion method. The results show that the screen has a significantly higher collapse rating than the standalone base pipe. This can be attributed to the effects of Darcy's Positive Compliance® methodology, the company said.

"We are experiencing a high level of interest from operators since the launch of the system. The production of sand and solids in oil and gas can represent a major problem in terms of well productivity; erosion damage and excessive sand production can also lead to a degradation, or in the worst case, compaction of the reservoir," said chief executive Steve Bruce, who heads the Darcy management team.

"These test results prove that we are on the right track in creating a step-change in possibility for operators. These operator sponsored tests give us independent verification and demonstrated the systems performance characteristics were better than expected. Conventional completion methods, which are well-established in the market, such as gravel packing and expandable screens, are able to help operators address sand mobility in the near wellbore. However, they are not able to address the source of the problem, beyond the near wellbore and in the formation as Darcy's solution does."

For more information visit, www.darcyflow.com.

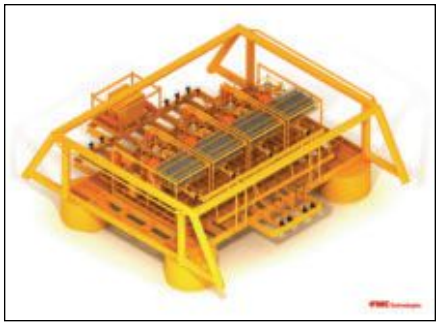
INTECSEA launches JIP focused on Arctic, cold region development

Eager to address the delivery of strategically important subsea developments in remote and hostile environments, particularly in offshore Arctic and cold-climate regions, INTECSEA is leading a joint industry project (JIP) aimed at yielding a wide spectrum of safe, reliable production opportunities with the application of existing and emerging technologies.

"The prize is enhanced confidence in deeper waters and ice-prone regions worldwide while improving the availability of valuable hydrocarbons," said Uri Nooteboom, president of INTECSEA.

Frontier developments in cold climates, where ice floes and icebergs are prominent much of the year, and in remote offshore Arctic areas require robust subsea systems that effectively manage the extraction of produced fluids and transportation to the end user.

As an industry leader in the engineering of offshore developments with active production technologies, Nooteboom advises that INTECSEA is in a unique position to move forward and support the industry in its endeavor to increase step outs, enhance recovery factors and production flow rates, and improve the economics of deepwater and cold region subsea developments.



Subsea compression stations, such as this one, compress gas to move it efficiently and safely from a subsea well to a host facility

INTECSEA kicked off the JIP in Dec.ember 2010 in St. John's, Newfoundland, Canada. Completion is scheduled for year-end 2011. JIP participants include three oil companies participating in Arctic developments offshore Eastern Canada. Petroleum Research Atlantic Canada (PRAC) administers the contractual entity.

The JIP partners foresee subsea processing requirements for both brownfield expansions and greenfield developments within the next decade.

Garry Mahoney, INTECSEA senior vice president of business development and chief technology officer, said JIP aims to encourage the use of proven and evolving technologies from deepwater Gulf of Mexico, offshore Brazil, and northern North Sea to enhance production in Arctic and subarctic waters, including offshore Eastern Canada.

"Our joint efforts will facilitate next-generation subsea solutions and improve confidence in the economic appraisal of offshore cold-climate developments while creating an open platform for industry collaboration," Mahoney said.

The current study will incorporate information from a 2007 study with additional updated information on conventional and emerging subsea technologies and relate them specifically to the participants' interests offshore Newfoundland, Labrador and Arctic environments.

The JIP will generate a database with an interface tool that allows operators and developers to screen and select from a broad array of active production technologies, including separation, boosting, compression, and direct electric heating systems suitable for stranded and existing field developments. The JIP committee continues to consider additional participants. Interested parties should contact ian.ball@intecsea.com.

Norway awards 24 oil and gas production licenses in 21st round

The Norway Ministry of Petroleum and Energy has awarded 24 oil and gas production licenses in its 21st offshore licensing round.

The licenses were divided between the Norwegian Sea and the Barents Sea, and Statoil, GDF Suez, and ExxonMobil were among the companies offered licenses.

Norway Petroleum and Energy Minister Ola Borten Moe said the 21st licensing round will lay the foundation for further exploration of the least explored areas of the Barents Sea and the deepwater areas of the Norwegian Sea.

Statoil was offered the operator role for eight licenses and 11 participating interests, while GDF Suez received three operator licenses, and Suncor Energy and Wintershall got two licenses each.

Premier Oil wraps up sidetrack appraisal well offshore Vietnam

Premier Oil has completed appraisal sidetrack CRD-2X-ST on Block 07/03, offshore southern Vietnam. The side track reached its planned TD of 10,958-ft. in the Miocene section, intersecting 60-ft. of net oil pay. This compares with 113-ft. of net oil pay encountered in the up dip CRD-1x well and 12.5-ft. in the down dip CRD-2x well.

Earlier, the main CRD-2X well had been drilled to a TD of 12,418-ft., testing gas and condensate in two reservoir zones in the Oligocene section. Total net condensate-gas pay in this well was 236-ft, compared with 55.8-ft. of net pay penetrated in the Oligocene section in the up dip CRD-1x.

Premier will incorporate the results into its assessment of the accumulation. The Ocean General rig will cross the offshore median line into Indonesia to drill two exploration wells on Premier's Tuna PSC.

India's OVL buys 25% stake in Kazakh oil block in Caspian Sea

India's state-run Oil and Natural Gas Corp Videsh (OVL) has purchased a 25% stake in an oil block in Kazakhstan.

OVL bought a portion of the Satpayev offshore block in the Caspian Sea under a deal signed between OVL and Kazakh state oil firm KazMunaiGas (KMG).

Under the transaction, OVL will pay $80 million to KMG.

Kazakh Oil and Gas Minister Sauat Mynbayev said the entire exploration program will be funded by the Indian company.

Delhi has allotted a total investment of up to $400 million for the Satpayev block, Reuters reported. The block is expected to have a peak output of 287,000 barrels per day.

Ensco 8504 ultra-deepwater rig contracted with Total in Brunei

Ensco plc said a subsidiary of the company has entered into a drilling contract for Ensco 8504 with Total E&P Deep Offshore Borneo B.V. Delivery from the shipyard in Singapore is planned for the end of July 2011 and the contract commencement will follow sea trials and mobilization to Brunei.

The initial contract term is for drilling three exploration wells for a minimum of 180 days with a base day rate of $423,500. Total may extend the term by exercising up to four options. The first two options may be exercised to complete up to three additional wells at the same day rate. The third and fourth options may be exercised to complete up to six additional wells at an escalated day rate. The fee for rig mobilization from Singapore to Brunei is $3.5 million.

When Ensco 8504 commences operations later this year, it will become the sixth ultra-deepwater rig in the active fleet. Ensco's other deepwater rigs are contracted in Brazil, the U.S. Gulf of Mexico, and French Guiana. Two additional Ensco 8500 Series® rigs are under construction, with deliveries scheduled in the first and second half of next year.

ExxonMobil Indonesia unit finds second oil field at Cepu block

ExxonMobil Corp.'s Indonesian unit said that it discovered a second oil field at the Cepu block it operates in East Java Province.

"Its similarity to the other Cepu fields provides confirmation of our exploration strategy on the block, and its proximity to Banyu Urip provides a good opportunity to advance development of this new oil discovery," Mobil Cepu Ltd. President Terry McPhail said. The well is located about 14 km from Banyu Urip, the first oil field found on the Cepu block in 2001. The company will analyze data from the recently found Kedung Keris-1 field to evaluate the resource potential of the reservoir.

Mobil Cepu and Ampolex (Cepu) Pte. Ltd., both subsidiaries of ExxonMobil, have a combined 45% stake in the block, while Pertamina EP Cepu owns 45% and the Cepu Block Cooperation Body, or BKS, holds the remaining 10%.

Dolphin Drilling signs Brazilian drilling deal for fourth quarter

Fred Olsen Energy's subsidiary Dolphin Drilling has signed a letter of intent to procure the semi-submersible Blackford Dolphin for the drilling of a well, offshore Brazil. Drilling is expected to begin in the fourth quarter of 2011 and will continue for 135 days.

The total value of the contract is estimated at $47 million, and the contract remains subject to final contract agreement, partner and management approvals.

The contract is expected to receive all of its required approvals by the end of May 2011.

Shell reactivates exploration plans for Arctic waters off Alaska

Royal Dutch Shell has made new drilling plans for the Arctic waters off Alaska after its previous plans failed due to local opposition, litigation and fallout from the Deepwater Horizon spill in the Gulf of Mexico.

The company plans to drill ten wells in 2012 to 2013 by using two offshore drill rigs to spud the leases in the Beaufort Sea off Alaska's northern coast and the Chukchi Sea off the northwestern coast.

Shell will submit formal exploration plans to the Alaska office of the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) concerning two wells to be drilled in the Beaufort Sea, Reuters reported.

Another proposal to drill three wells in 2012 and another three in 2013 in the Chukchi Sea will be submitted to the federal authorities soon.

Meanwhile, BOEMRE said a worst-case scenario for a blowout in the Chukchi Sea lease area could put more than 58 million gallons of oil into Arctic waters. A memo prepared by the agency said a blowout worst-case scenario could discharge nearly 2.6 million gallons per day initially, but would decline rapidly; however it still could leak more than 58 million gallons in a month.

TEPA, Sonangol find new oil on Block 17/06 offshore Angola

Total subsidiary TEPA (Block 17/06) Ltd. and Sociedade Nacional de Combustiveis de Angola (Sonangol) reported a hydrocarbon discovery in the northeast portion of deep offshore Angola Block 17/06.

Water depth is 1,460-ft. at the Canna-1 well, which tested at more than 5,000 b/d of 33 degree API oil from a Miocene reservoir.

Sonangol is concessionaire on the block. TEPA is operator with 30%, and the other partners are Sonangol Pesquisa e Produção SA (30%), Sonangol Sinopec International Seventeen Ltd. (27.5%), ACREP Bloco 17 SA (5%), Falcon Oil Holding Angola SA (5%), and PARTEX Oil and Gas (Holdings) Corp. (2.5%).

BG books drillship Deep Sea Metro I for Tanzania wells

BG Group has contracted the new drillship Deep Sea Metro I for its next deepwater exploration campaign off Tanzania. Odfjell Drilling will manage and operate this program on behalf of the Deepsea Metro venture.

The $175 million contract has a firm duration of 365 days, with three 6-month options.

Deep Sea Metro I, built by Hyundai Heavy Industries (HHI), will drill its first well for Woodside Energy offshore South Korea prior to start of operations in Tanzania. The vessel is undergoing sea trials, to be followed by final commissioning and system integration testing prior to delivery on 31 May. Sister drillship Deep Sea Metro II will be delivered from HHI in November.

The Metrostar Group has 60% ownership in the two vessels, the remainder held by Odfjell Drilling, which is contractually responsible for construction follow-up and management.

OGX identifies hydrocarbons in well OGX-30 in the Santos Basin

OGX Petróleo e Gás Participações S.A. (OGX), the Brazilian oil and gas company responsible for the largest private sector exploratory campaign in Brazil, said it identified the presence of hydrocarbons in the Albian section of the 1-OGX-30-RJS well in the BM-S-58 block, in the shallow waters of the Santos Basin. OGX holds a 100% working interest in this block.

"OGX-30 (Salvador) confirmed a new play in fractured carbonates in the Albian age, with a significant gas column and a large structured area," said Paulo Mendonça, general executive and exploration officer of OGX. "This discovery helped us to verify the geological model for this region, enabling us to now begin the appraisal activities for this discovery."

A hydrocarbon column was encountered in Albian carbonates with approximately 330m and extensively fractured through 50m in the well section. This discovery is located in an area contiguous to the Belém accumulation which was discovered through the drilling of well OGX-17 and for which the discovery evaluation plan was recently approved by the ANP in the BM-S-56 block. Both discoveries showed similar columns and structures that could be complementary to each other, further increasing the synergy for production, OGX said.

A drill-stem test was performed, which provided important information for determining the reservoir's parameters, including high pressure and high temperature, and also helped in the fluid analysis. The gas analysis determined that it is a rich gas, with a high calorific value. The next step will consist of performing production tests with equipment that is adjusted for the pressure and temperature of the well.

The OGX-30 well is located approximately 105km off the coast of the state of Rio de Janeiro at a water depth of approximately 150m. The Ocean Quest rig initiated drilling activities in this location on 11 Jan. 2011.

Leiv Eiriksson going to Falklands; BOP includes casing shear arms

Borders & Southern Petroleum has contracted a replacement rig for its first drilling program offshore the Falkland Islands. Ocean Rig UDW will now supply the semi-submersible Leiv Eiriksson in place of the previously assigned sister semi Eirik Raude. Leiv Eiriksson is a fifth generation, harsh environment, dynamically positioned rig. Its BOP was recently upgraded to include casing shear rams.

Sankofa boosts Ghana gas hopes based on appraisal drilling results

Eni's Sankofa find offshore Ghana could be larger than first thought, according to results from appraisal drilling. The Sankofa-2 well was drilled in 2,834-ft. water depth in the Offshore Cape Three Points (OCTP) license, 34 mi. from the coast. On test, the well flowed 29.5 MMcf/d (constrained) of gas and 1,000 boe/d of 52 degree API condensate.

Drilling confirmed the presence of 115 ft. net gas and condensate sands in the Cretaceous. A 19.7-ft. oil leg was also encountered and will be the subject of further studies.

Initial evaluations suggest a significant increase in estimated gas in place at the discovery, raising hopes that Sankofa could provide Ghana's first offshore development of non-associated gas.

Eni Ghana Exploration and Production operates the OCTP license with a 47.22% interest, in partnership with Vitol Upstream Ghana (37.78%) and Ghana National Petroleum Corp. (15%). GNPC has a back-in option for an additional 5%.

Centrica signs sharing contract with Trinidad and Tobago

Centrica has signed a production sharing contract with Trinidad and Tobago to explore, develop, and produce hydrocarbons from the NCMA 4 Block offshore the country.

Centrica's Trinidad and Tobago manager Ko Jacobs said activity at NCMA 4 ties in with the company's development plans in another offshore area known as block 22.

Centrica is assessing various options to easily commercialize the discoveries, which include a floating liquefied natural gas (LNG) facility.

Paradigm Oilfield secures $400,000 Greenland equipment contract

Paradigm Oilfield Services has secured a $400,000 contract to supply equipment for a drilling operation in Greenland.

The Aberdeenshire-headquartered company revealed at the Offshore Technology Conference in Houston that it delivered the shipment, which includes its own custom-designed dual stage hole opener known as "The Beast." The order, with a leading independent operator, is for 18 tools that includes Paradigm Oilfield Services' high quality stabilizers and hole openers.

"This is our first large contract for this new frontier region where we believe there are many opportunities for the robust tools that we have developed," said Fraser Innes, chairman of Paradigm. "Greenland has significant untapped oil and gas reserves, and there is a growing interest in drilling activity."

Greenland's government distributed seven prospecting blocks in the Baffin Bay, west of Greenland, among eight oil companies in November last year. More than a fifth of the world's undiscovered oil and gas resources are thought to lie north of the Polar Circle.

ExxonMobil unveils development plan for Newfoundland's Hebron

ExxonMobil formally submitted an application to develop Newfoundland's Hebron oilfield, outlining heftier production platform costs and first oil by late 2017. The cost of building the Hebron platform and drilling development wells is now estimated at more than $8.3 billion, according to the application for the province's fourth offshore oilfield that was filed on April 15 with the Canada-Newfoundland and Labrador Offshore Petroleum Board.

Earlier, Hebron development costs were thought to be around $5 billion, though that estimate was several years old. ExxonMobil estimates that production operations will cost more than $5.8 billion over the life of the oilfield until 2046. The application anticipates a $3.5-billion price tag for a portion of Hebron known as Pool 3, but it could go as high as $5 billion if it's fully developed. Discovered in 1981, the Hebron oilfield consists of three main fields — Hebron, West Ben Nevis and Ben Nevis — containing a combined 700 million barrels of oil.

Nexen gives go-ahead for Golden Eagle project in central North Sea

Nexen's board has approved development plans for the Golden Eagle project in the UK central North Sea. This will involve the installation of two platforms with production capacity of around 70,000 boe/d. Nexen is operator with a 36.5% working interest. Assuming partner and regulatory approval, project sanction is expected in mid-year, leading to first oil in late 2014.

"Golden Eagle is the largest oil discovery in the North Sea since Buzzard," noted Marvin Romanow, chairman and chief executive officer. "This project is economically attractive at oil prices much lower than today."

The development cost is estimated at $3.3 billion, with Nexen's share at around $1.2 billion. The investment remains attractive, Romanow said, despite the recent decision by the UK government to increase the tax rate levied on oil and gas activities.

Statoil seeks approval for Katla discovery development

Statoil has submitted a plan to the Norwegian Ministry of Petroleum and Energy for the development and operation of the Katla discovery in the North Sea. Total investments at the Katla discovery, proven in March 2009, are estimated at around $1 billion.

Production from the discovery, which has around 45 million barrels of oil reserves, is expected to start in the first quarter of 2013. Statoil plans to develop the discovery with a seabed template and four wells, two of which will produce oil and gas while the other two wells will inject water into the reservoir for pressure support.

Oseberg South platform will receive oil from Katla, while the gas will be used as pressure support on Oseberg Omega North — and thus helping to maintain production in the reservoir.

EMAS to manage Israel's Tamar installations for Noble Energy

Noble Energy has contracted EMAS AMC for a subsea spread for the Tamar deepwater development offshore Israel. Under the $88 million contract, EMAS AMC will install around 205-mi. of umbilicals and subsea distribution equipment and deliver subsea suction piles and jumpers.

The umbilicals and subsea distribution equipment are being manufactured by the Aker Solutions Group in Mobile, Alabama. EMAS' parent company, Ezra and Aker Solutions, has started a 5-year cooperation agreement in connection with the recently completed acquisition of Aker Marine Contractors.

The Tamar project is an example of a bundled solution for subsea equipment that the two parties had envisaged.

EMAS also has a letter of award-intent for a project worth up to $32 million from an unnamed major oil company. This involves providing subsea support services connected to maintenance for a floating storage facility offshore Africa.

Houston-based Noble Energy Inc. and its local partners recently announced that drilling had begun in the Tamar field. The drilling, which will be done in three stages, is expected to take about 1 year and Tamar is expected to start producing natural gas by the end of 2012, the companies said. The field is estimated to contain up to 9 trillion cubic feet of natural gas.

MTNW completes anchor winch monitoring project in Nigeria

Measurement Technology NorthWest (MTNW) received a major award from Adamac, a leading Nigerian oil and gas services company based in Port Harcourt. The project called for nine running line tensiometers, displays, and software to monitor the anchor winch lines for a pipe-laying barge.

"The Gulf of Guinea off of Nigeria is one of the fastest growing new oil patches. It is becoming as criss-crossed with subsea pipes as any ocean in the world," explained Tom Rezanka, managing director of MTNW. "Oil companies operating in subsea environments have to be very careful about where they place their anchors for mooring. They need to know immediately if one of their anchors is slipping and could potentially pull through other nearby pipelines, or disrupt the laying of their own pipe."

Kehinde Onibokun, assistant general manager of Adamac's pipelines unit agrees with Rezanka, adding: "part of our responsibility for personnel, equipment and environmental safety is to ensure that our own pipeline laying equipment is outfitted with the latest technology for monitoring. MTNW's anchor winch monitoring technology provides instant feedback to the vessel operators for immediate decision-making and also has data-logging for long-term, after-action review and analysis."

Rezanka said that having technology continuously monitor anchor winch tension trends and historical peak loads locally at the winch station, in the control room, and remotely through the PC increases the safety factor beyond other currently available systems.

MTNW also has placed anchor winch mooring systems in the North Sea, Dubai, Venezuela and Singapore.

Statoil starts up first Brazilian field; output to peak at 100,000 boe/d

Statoil has brought on stream the Peregrino field in the Campos Basin off Brazil. Production should build steadily to a peak of 100,000 boe/d. Peregrino is 53-mi. offshore in 328-ft. of water in licenses BMC-7 and BMC-47.

Phase I of the development includes two drilling and wellhead platforms and a large FPSO with 37 horizontal wells to maximize recovery. The field holds 300 to 600 MMboe recoverable, with significant upside, according to Statoil. An exploration well is under way at Peregrino South to test this potential. Following completion, one additional well will be drilled in the area.

"The Peregrino field showcases our project management, execution, and subsurface and reservoir management skills," Statoil's country manager in Brazil, Kjetil Hove, said. "We are using our experience gained at the Norwegian continental shelf to share competence and experience and to create value locally in Brazil."

The field was discovered in 1994. Statoil acquired an initial 50% interest in 2005, and the remaining 50% and operatorship in 2008. Brazil's authorities approved the development plan in 2007.

In May 2010, Sinochem Group took a 40% interest in the project, leaving Statoil as operator with 60%. Closing of this transaction was pending governmental approvals.

Chevron applies to raise Gorgon natural gas output by 5M tonnes

Chevron has applied to boost planned production at its $43 billion Gorgon liquefied natural gas project in Western Australia by 5 million tonnes a year, arguing that the move will reduce the world's reliance on coal and help to lower carbon emissions.

Chevron's planned expansion would take annual production at Gorgon from 15 million tonnes to 20 million tonnes by adding an extra processing unit, which is known as a train.

Construction of the first three trains began in late 2009 and the massive project is scheduled to be in production by 2014. Ultimately, Chevron wants to boost Gorgon's capacity to five trains capable of producing a total of 25 million tonnes a year and making it one of the world's largest LNG projects.

Chevron said it plans to build the fourth train only after the first three units are in place in 2014.

Cameron, Halliburton combine on all-electric subsea controls system

The second generation Cameron DC all-electric subsea production system with the first-ever electric subsurface safety valve from Halliburton debuted at the Offshore Technology Conference in early May in Houston.

Cameron said the new system builds on its experience with all-electric subsea systems and features:

• State-of-the-art communications – The new system uses fiber optic cables which increases the data transmission rate through an open-architecture that is plug-and-play ready.

• Improved functionality – The second generation system doubles the available functions from 16 to 32 possible. This means fewer modules and less power are required.

• Cost comparison — This simplified architecture and improved functionality serve to make the cost of the all-electric system competitive.

Varel, Downhole Products introduce the CaseBit™ drilling with casing bit

Varel International has unveiled the development of the CaseBit™ advanced casing drill bit product line, a joint development with Downhole Products (DHP), a Varel International Energy Services company.

The CaseBit product line is a patent-pending solution that addresses the need for an advanced cutting tool for drilling with casing (DWC) operations. The proprietary approach combines key polycrystalline diamond compact (PDC) drill bit technologies, including force balancing, spiral and asymmetric blades, cutting structure wear modeling, and computational fluid analysis with highly flexible manufacturing and casting technology. The result is an optimized, custom casing bit capable of drilling performance exceeding competitive bits.

For continued deepening of the well, the CaseBit solution is also designed to be readily drilled through by a smaller diameter PDC bit once the casing has been set and cemented in place. The "Machineable Matrix" body construction allows for greatly enhanced design flexibility, speedy manufacturing response, and unsurpassed drillability.

In addition, patents pending external and internal body configuration accelerates drill out and improves the breakup of the bit face during post-cementing drill out by the following string.

For more information on this product, visit company websites at www.varelintl.com or www.downhole.org.

Vectron International's ultra-high temperature crystal oscillator

Vectron International has a new solution for the timing of ultra high-temperature electronics, the PX-570 crystal oscillator. Able to withstand continuous operating temperatures of up to 230°C, this product is said to be ideal for harsh environment applications, including oil and gas downhole operations.

With the PX-570, Vectron successfully combines its unique compliant quartz resonator mounting techniques with a six-leaded HTCC package, creating a design with the highest package to board attachment fatigue resistance capable of surviving shock levels of 1,000 Gs. In addition, the PX-570 has the industry's tightest frequency versus temperature performance of ±100ppm from -55°C to plus 230°C.

"In the high-temperature electronics community, not only are operating temperatures and lifetime requirements increasing, parts are often subject to very harsh shock and vibration," said Gregory Smolka, vice president of the IMS business unit at Vectron.

Vectron's PX-570 is available direct at www.vectron.com.

Viper Subsea's V-LOCK designed to meet future industry demands

The innovative new V-LOCK® hydraulic stab plate, a subsea hydraulic connector providing a critical function in subsea control distribution systems designed and manufactured by Viper Subsea, was put on display at the Offshore Technology Conference (OTC) in early May in Houston, Texas.

V-LOCK® was developed following extensive consultation with first tier suppliers, end users, and installation contractors and was designed to meet the demands of the subsea industry for the foreseeable future. V-LOCK® offers the market a future-proof solution, delivering considerable advantages over existing systems, both in terms of performance and installation. The innovations built in to V-LOCK® means its performance is significantly better than existing products.

The V-LOCK® offers market leading clamping and separation force, and the secondary release system is positively actuated with no reliance on any form of shearing mechanism. The secondary release system also incorporates a means of providing a separation force, a feature unique to the V-LOCK®. Separation force is a key consideration particularly for environments prone to build up of marine growth. V-LOCK® also has been designed with make-up misalignment capability, which ensures that the V-LOCK® can be installed with significantly reduced ROV intervention times and associated installation costs. Visit www.vipersubsea.com.

Moyno® High Temperature Down-Hole Pumps

Moyno® down-hole pump solutions said to extend application range

R&M Energy Systems offers a line of innovative Moyno® High Temperature Down-Hole Pump Solutions. The Moyno high temperature down-hole pumps, (Moyno HTD™ pumps) provide solutions to high temperature applications that previously prevented operators from using down-hole progressing cavity pumps (PCPs).

This technology allows R&M to provide solutions for artificial lift using PCPs in thermal applications. PCPs have not always been the ideal fit for thermal wells but with the advances in elastomers, bonding mechanisms, and metal to metal technology, more producers are considering them as a means of artificial lift. They are an ideal fit for pilot applications or producing wells. Producers consider PCPs over other means of artificial lift, such as ESPs, due to lower capital costs.

They are also an ideal fit for "wedge" wells in SAGD applications. A wedge well allows access to the unrecoverable bitumen located in between the well pairs. A PCP can be installed in this type of application due to the smaller surface footprint and the lower downhole temperatures compared to the producing wells.

For more information, visit www.rmenergy.com.

CEP to manufacture, distribute OPFLEX™ spill clean-up products

Complete Environmental Products (CEP), a provider of conventional oil spill products, including pads, sweeps, and booms, has entered into an agreement with Opflex Solutions LLC to manufacture and distribute OPFLEX™ pads, booms, sweeps and mops for U.S. Gulf Coast restoration.

"OPFLEX™ has set the new standard as the leading green technology that can be used in conjunction with conventional containment booms to increase the efficiency of oil spill cleanups and minimize carbon impact and damage to the environment," said Chad Clay, president and chief executive officer of CEP.

For more information, visit www.opflex.com, or contact opflexpublicity@gmail.com.

Halliburton delivers next-generation deep reservoir testing technology

Halliburton announced the delivery of its next generation well-testing technology for deepwater environments. The technology provides improved economies to operators by enabling more efficient and reliable reservoir testing.

DynaLink® – Halliburton's proven, two-way wireless acoustic telemetry system – now has the added capability to control down-hole test tools from the surface during drillstem testing operations while transmitting real-time bottomhole pressure and temperature data.

Real-time bottomhole pressure, temperature and fluid data, and acoustic actuation of test tools help to provide operators with the benefit of changing the pre-defined well testing program based on reservoir response while testing.

"When a drillstem test is performed using memory mode devices as the only way of downhole data acquisition, an operator cannot determine if the well testing objectives have been achieved until the drillstem test string is pulled out of the hole," said Abdalla Awara, vice president of Halliburton's testing and subsea product service line. "The DynaLink high-rate downhole acoustic data acquisition gives the assurance that well-testing objectives have been achieved in real time. In short, this technology delivers efficiencies in optimizing rig time while assuring the quality of the test data."

This technology was recently deployed successfully in deepwater wells in Mexico and Brazil. For more information, visit www.halliburton.com.

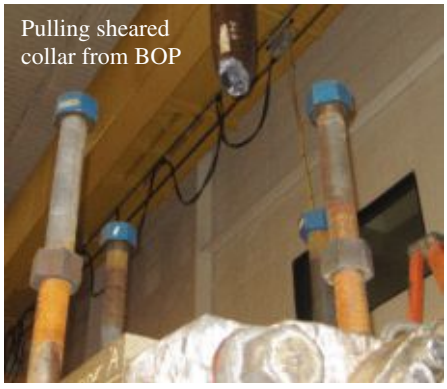
Radoil, Inc. announces sheared and sealed a 6.75-in. drill collar

Radoil, Inc. has announced that it has successfully completed an oil industry first by designing and producing a shearable drill collar.

At GE Oil & Gas, Drilling & Production's (GE) Houston, Texas BOP test facility, a group of 11 deepwater industry individuals witnessed the 1,725 psi. shearing and subsequent BOP sealing (seal pressure test 10K) of Radoil's new drill collar design. This is a significant step forward in drilling safety as it provides a replacement for the traditional, un-shearable solid steel drill collars.

Radoil thanked GE for their assistance and involvement in providing a standard 18 ¾-in., 15K, Hydril Pressure Control Compact Ram blind shear system with 3,000 psi bonnet and 22-in. operator to shear the drill collar. The new drill collar is a patent pending design which includes an outer 6.75-in., 0.5-in. wall shell and an inner 2.157-in., 0.109-in. wall bore pipe with the interstitial space filled with lead. The shearable drill collar has a weight of 141.9 lb/ft versus 108.3 lb/ft with solid steel drill collars. The drill collar's lead-filled design makes it shearable while providing the desired weight and stiffness for normal drilling operations.

For more information, visit www.radoil.com.


Pulling sheared collar from BOP

Subsea 7's AIV

Subsea 7, a global leader in seabed-to-surface engineering, construction and services, today announced that it has completed the design and build of the first commercial Autonomous Inspection Vehicle (AIV), a technology that has the potential to revolutionize Life-of-Field projects.

Subsea 7 has an ambitious plan to develop a series of AIVs, initially capable of general visual inspection, through to fully capable work-class sized intervention vehicles. A combined project team comprising hardware developers and operational personnel from Subsea 7 and Seebyte, a Scottish based software developer for the autonomous robotics market, has been working together to deliver the first vehicle.

The design and build of the vehicle is complete and successful progress through in-water trialling and commissioning phase is underway. Following completion of extensive in-water testing and capability development, the first commercial AIV is expected to be available in late 2011.

Through the development process, many technical challenges have been overcome, the shape of the vehicle has changed from the original design concept due to the significant work done using the latest Computational Fluid Dynamics Modelling to optimize the vehicle's shape with regard to stability and maneuverability while conserving the onboard power resources.

The vehicle is fully autonomous and can operate for a 24-hour period on a single charge of its lithium-ion batteries, which are housed in pressure vessels within the hull. These batteries have been specifically designed for the vehicle and provide a more cost-effective solution to pressure-tolerant batteries, with a lower capital cost and much improved cycle lives.

The sensor package has been developed to cover the requirements of general visual inspection; it comprises the latest sonar technology coupled with high-quality video cameras and low-power LED lighting.

A significant software integration and development project has been running in parallel with the hardware development, and this too, has used the most advanced techniques to manage, debug and control the development.

Neil Milne, Subsea 7's Vice President - Life-of-Field Services, commented: "We are delighted with the success of the commercialization programme to date for what represents a significant technological advance in the area of subsea remote inspection and intervention. With the arrival of the AIV, subsea structures, such as manifolds, wellheads, and risers will be able to be inspected by this tetherless technology, significantly increasing flexibility and efficiencies throughout the life-of-field cycle. Following completion of extensive trials and further development over the coming months, we look forward to bringing the first commercial AIV into operations towards the end of 2011."

Trencher LARS for Canyon Offshore

IHC Engineering Business (IHC EB), a part of IHC Merwede group, has recently been awarded a contract for the supply of a 35-tonne Launch and Recovery System (LARS) to Canyon Offshore Ltd (Canyon). The A-Frame system will be used to launch and recover a new build trenching ROV.

IHC EB engineers have been designing and building launch and recovery systems for over 25 years. These have been used to handle a wide range of equipment from ROVs to the largest cable ploughs. All of the systems are designed to maximize productivity, provide a long and reliable service life, and minimize through life operational costs by careful design and high quality construction.

This award will mark the second LARS that IHC EB has built for Canyon, having previously supplied a 95-tonne SWL system for the i-Trencher, which was built in 2008.

The new LARS will be able to launch and recover the 35-tonne vehicle in up to Sea State 5. The system will be designed over the coming months, before assembly and testing at the Port of Tyne for delivery in 2012.

For more information, visit www.ibcmerwede.com.

UIE Underwater Services recorded the 1,000th dive

The Seven Atlantic dive support vessel has reached a major milestone in achieving 1,000 dives without lost time incident (LTI). The vessel, which has been in operation for a year, is owned and built by Subsea 7 and encompasses a Divex designed and built state-of-the art saturation system.

George Thomson, Team Lead – Underwater Vessel Operations for Shell U.K. Limited, said, "The performance of the Seven Atlantic has proved to be fantastic after over 1-year of operation. The success of our joint ventures is wholly attributable to the professional approach of our personnel."

The Divex designed and built dive system includes ergonomically designed divers' living space as well as SATCON, a computer-based control system providing automation of life support equipment, and the hyperbaric environment, including pressure control.

The development of the integrated control and monitoring system is based on established SCADA (supervisory control and data acquisition) as well as PLC (programmable logic controller) and HMI (human machine interface) systems. The overall control system is called SATCON.

The dive system, which meets NORSOK standards, has been paramount during the design and build process. Divex worked closely with Subsea 7 to ensure that the system has been integrated successfully, which, at times, has been extremely challenging.

Safety, diver comfort, quality, and traceability are all benchmarks for this and similar Divex systems that will be in operation during the next phase of saturation diving history.

The key features of the diving system onboard the vessel are: the chamber layout, enhanced diver living standards, dual hyperbaric life boats, bell configuration, bell location, triplicate power supply, bell launch and recovery system (LARS), control rooms and offices, and the advanced gas management systems.

Divex would like to congratulate the staff at Shell and Subsea 7 for this momentous achievement!

Schilling reports multiple ROV sales

Schilling Robotics, LLC, experts in subsea systems, announced that C-Innovation has placed a contract for multiple ROV systems in support of their expanding international operations. This contract includes the supply of both HD™ and UHD™ work class ROV systems that will be deployed globally, including Brazil and Singapore.

C-Innovation HD™ ROV

This continued expansion of C-Innovation's ROV fleet with a mix of the HD™ and UHD™ systems will broaden their regional capabilities and target markets, especially with the addition of the mid-size HD™ system that complements C-Innovation's existing fleet of over 25 UHDs™.

Schilling has also announced the award of a contract for two ROV systems from specialist subsea service company DOF Subsea. The award is for one 200hp UHD™ ROV system and one 150hp HD™ ROV system. Deliveries of the ROVs are scheduled to commence in the third quarter of 2011.

The order follows the September 2010 commitment from DOF that now expands their fleet to include eight Schilling Robotics ROVs. As DOF continues to grow its presence in the international deepwater market, the combined flexibility of the HD™ and UHD™ will enable DOF to expand its services offering.

Most recently, Schilling received an order for eight Heavy-Duty™ (HD™) ROV systems from integrated offshore oil and gas solutions provider EMAS, the operating arm of Ezra Holdings Limited. The HD™ systems will be rated for 4,000m and will be supplied with 850m capacity tether management systems. EMAS will install the HD™ ROV systems onboard four of their dedicated deepwater vessels in support of the company's expanding international offshore construction business.

For more information, visit www.schilling.com.

Navigators for RNLN divers

In December of 2010, Shark Marine Technologies Inc. of St.Catharines, Ontario, delivered a quantity of their Navigator, diver-held sonar and navigation Systems, to the Royal Netherlands Navy (RNLN). The Navigators will be used by the RNLN clearance divers for VSW MCM and ship hull inspections as well as to assist local civilian authorities in searching for drowning victims and underwater criminal evidence.

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

The RNLN joins a growing community of NATO and NATO-friendly country's who have selected the Navigator to aid their clearance diver's underwater operations.

The Navigator is a modular Windows-based system with standard computer interfaces that allow for easy integration of numerous accessories. Controlled by Shark Marine's DiveLog software, the basic Navigator includes a Blueview, high-resolution imaging sonar, a rechargeable

NiMH battery pack and charger, tool kit, and rugged shipping case. Internal sensors include a compass, heading, pitch and roll sensor, and a depth sensor. Additional "plug and play" sensors, including GPS, are readily available. All information may be displayed on the Navigators built-in 6-in. LCD display or on the optional head-mounted display. Standard computer interfaces include USB 2.0, RS232/485, Ethernet, and a QXGA external video port, as well as both WiFi and Bluetooth for wireless communications. Readily available accessories include a USB-attached video/digital still camera, digital magnetometer, gradiometer, radiation detector, a floating GPS, and both a Long Base Line and Doppler system for accurate positioning applications.

The Navigator's DiveLog software gives the operator easy control over the attached accessories. Toggled operational screens allow rapid selection between the sonar, map, and an auxiliary device. As the diver follows uploaded pre-mission data on the map display, the Navigator simultaneously records and displays his actual route.

Drop-down charts allow operators to record quick descriptions of targeted objects along with any associated photos, video, or sonar imagery. Divelog interfaces with SeeTrack Military and other mission planning software for exchange of target location and positioning information as well as route planning and track recording details. It is currently compatible with ENC S57, S63, and BSB style charts.

For more information, visit www.sharkmarine.com.

Trinadad's OSTL orders Panther XT

Trinidad-based Offshore Technology Solutions Limited (OTSL) has ordered the new top-selling Saab Seaeye Panther XT Plus electric work ROV.

With 10 powerful thrusters, 50% more power and swimming 30% faster than any other electric work ROV of its class, OTSL say the Panther XT Plus will greatly extend its operational role in the offshore oil and gas industry.

"We consider the new Panther is the best in its class and the best value for money, with an unequalled power to weight ratio," says OTSL Operations Business Leader, Antonio Donawa.

"It means we can target both deep-shelf support work and shallow water work with an ROV resource across a wide range of tasks, including IRM, pipe and platform inspection, drilling support, and emergency response."

With the company specializing in marine construction, maintenance, and

subsea services from the Gulf of Mexico, through the Caribbean and down into Latin America, the ability of the new Panther to hold steady in strong, shallow-water currents makes it ideal for a wide range of work and survey tasks as well as deepwater operations over 1,000 meters.

The configuration chosen by OTSL includes a Seaeye wide-angle B&W low light camera and a Kongsberg color zoom camera together with pan and tilt system; a Tritech Super SeaKing sonar; a five and six function heavy-duty manipulator with grabber; a water jetting system and a Cygnus ultrasonic thickness gauge with CP contact probe, BlueView imaging sonar, and state-of- the-art Visual Soft DVR and inspection software.

For pipe survey work, the ROV has two, three-function hydraulic camera booms, a wheeled skid, and manipulator system plus two Seaeye cameras.

A tether management system is included with 200m of tether cable and its own camera. Also supplied is a control container and a launch and recovery A-frame with 1,100m umbilical cable capacity, a certified bullet assembly, and lock latch assembly with snubber rotator.

Behind the success of the new Panther XT Plus is its evolution from the proven Panther concept into a more powerful vehicle with an increased payload and redesigned frame with more space for additional equipment.

It means the vehicle has the capacity to accommodate larger and heavier manipulator arms that can include a seven-function position feedback manipulator and five-function manipulator, along with a greater range of tools and sensors.

For operators working to a tight deadline or in difficult conditions, an added bonus is that 10 thrusters in hand offer a high degree of redundancy with a resulting peace of mind.

The OTSL Panther XT Plus is the fourth of this new Saab Seaeye design sold so far this year and adds to the more than 500 vehicles that have been sold in the company's 25 year history.

ISE

International Submarine Engineering Ltd.

SNK HYSUB 150-4000

SNK HYSUB Console

FUGRO HYSUB 150-5000

THESEUS AUV under the ice

The awards

OEC Hall of Fame
Ernest C. Manning Award of Innovation
MTS Compass Industrial Award
MTS Compass International Award
MTS Compass Distinguished Achievement Award
IEEE Engineer of the Year
IEEE Technical Achievement Award
BC Science & Engineering Gold Medal
Professional Engineers of BC Meritorious Achievement Award
Joseph F. Engelberger Award for Technology Development

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First AUV to operate autonomously (ARCS 1984)
First AUV to conduct a hydrographic survey (ARCS 1985)
Longest tethered AUV mission (Theseus 1996)
Heaviest AUV payload (Theseus 1996)
Longest single AUV mission (Theseus 1996)
Longest unsupervised AUV mission (Explorer 2010)
First Arctic seafloor survey by an AUV (Explorer 2010)
Longest period of continuous operations without recovery (Explorer 2010)

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OPT PowerBuoy Update

Deborah Montagna, Vice President Government Systems,
Ocean Power Technologies

Ocean Power Technologies Inc (OPT) has a mission to manufacture and provide OPT's proprietary PowerBuoy System to produce low-cost, non-polluting, renewable electricity from ocean wave energy with the focus on scalable, turnkey wave power stations for grid-connected applications and autonomous systems for non grid-connected applications. OPT's wave energy converter device is the PowerBuoy®.

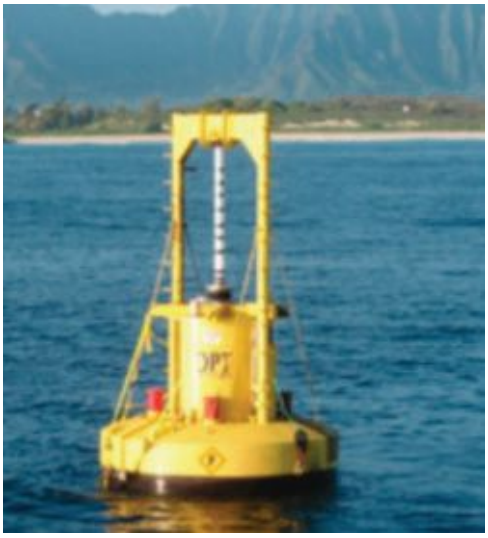

Figure 1 *OPT's PB40 Currently deployed at Marine Corps Base, Hawaii*

OPT has been actively developing PowerBuoy wave energy conversion technology since 1994. Using extensive wave tank and computer modeling, scientifically-grounded scaling techniques, and long-term sea testing, OPT has successfully developed PowerBuoys from 150W to 40kW and, most recently, to 150kW, conducting more than 58 months of ocean testing on eight PowerBuoy systems in the Atlantic and Pacific Oceans.

OPT's PB40 PowerBuoy

Under the U.S. Navy's Small Business Innovation Research (SBIR) Program, OPT's first PB40 dual-absorber PowerBuoy, shown in Figure 2b, was deployed off the coast of New Jersey for two 1-year periods and survived the wind and wave forces of several gales and hurricane remnants during those periods prior to removal for maintenance. The long duration prototype ocean test in New Jersey demonstrated the survivability of the dual-absorber PowerBuoy in an array of ocean wave conditions.

OPT received a follow-on contract from the Office of Naval Research (ONR) to conduct ocean test activities directed toward furthering the research in ocean wave energy by installing a grid-connected wave power system at the U.S. Marine Corps Base (MCBH) at Kane'ohe Bay in Oahu, Hawaii. The purpose of the project was to evaluate the technical feasibility of converting wave energy into usable electric power for Navy applications. OPT and the Navy have been funding the development and demonstration of a wave power system in Hawaii under this commercialization program.

The infrastructure at the MCBH site consists of subsea and land power and fiber optic cables for the grid connection, a shore station that contains the grid connection equipment and communications and control system, and the seabed construction for the anchor/mooring system to support two buoys.

Preparation for the project and the design of the PowerBuoy deployment in Hawaii enabled OPT to achieve a number of key credibility milestones for OPT and the industry. Environmentally, the independent Environmental Assessment (EA) performed for the project resulted in a Finding of No Significant Impact (FONSI), the best rating achievable. Also, OPT's PowerBuoy interface with the electrical utility power grid was certified as compliant with national (UL) and international standards, thereby permitting OPT to do the first utility grid connection of the technology.

As part of the program, the Navy provided ongoing support and expertise to OPT on anchoring, mooring systems, marine survivability, and related subsea design areas. In addition to the milestones above, the program has made significant accomplishments:

- A utility-grid cable was deployed, and onshore infrastructure installed.
- Years of in-ocean experience has been gained allowing us to hone and perfect OPT's control systems.
- OPT's hydrodynamic models have been validated and refined and are now proven to be within 10% to 20% of real-world performance measurements.
- OPT's Active Impedance Matching System (AIMS) algorithm has demonstrated a significant improvement in measured efficiency.
- A direct drive advanced Power Take-Off (PTO) with significant improvements in efficiency and reliability has been developed.
- OPT's PB40 PowerBuoy was connected to the utility grid.

PowerBuoy deployed off Marine Corp Base Hawaii, Kaneohe Bay, Oahu, Hawaii, 2005-2006
Hawaii Buoy 1
Generation 1
(a)

PowerBuoy deployed off Tuckerton, New Jersey
2005-2006; 2007-2008
Generation 2 Prototype
(b)

PowerBuoy deployed off Marine Corp Base Hawaii, Kaneohe Bay, Oahu,Hawaii,
June 2007
Hawaii Buoy 2
Generation 2
(c)

PowerBuoy deployed off Marine Corp Base Hawaii, Kaneohe Bay, Oahu, Hawaii,
Oct-Dec 2008;
Dec 2009 to present
Hawaii Buoy 3
Generation 2
(d)

Figure 2 *Example PowerBuoy deployments with the U.S. Navy*

The long-term PB40 deployments in Hawaii, along with those in New Jersey and other worldwide locations, have given OPT the knowledge to make the step to large scale power production systems, which recently culminated in the deployment of its first PB150, 150kW PowerBuoy, a major milestone in OPT's technology development plans.

PB150, OPT's commercial utility-scale PowerBuoy

Figure 3 *OPT's PB150 ready for deployment*

The first utility-scale 150 kW PowerBuoy, fabricated in Scotland, shown in Figures 3, 4, 5 and 6, was deployed on 15 April 2011 and ocean trials are currently being conducted at a site approximately 33 nautical miles from Invergordon, off Scotland's northeast coast. The power produced to date in this commissioning phase has been as planned and is consistent with the test protocols and OPT's predictive models for the wave environment experienced, further validating the predictive hydrodynamic and power take off models this time at larger physical scales.

A second PB150 PowerBuoy is being fabricated in Portland, Oregon and is also planned for final assembly this summer, for deployment in 2011. This buoy is the first in a planned array deployment where 10 PB150 PowerBuoys will be installed for the 1.5 MW "Reedsport Project" supplying power to the Pacific Northwest electric grid.

Figure 4 *OPT's PB150 in the process of "uprighting"*

Figure 5 *OPT's PB150 on location*

OPT has received two grants from the U.S. Department of Energy for the "Reedsport Project". The most recent is for the PB150 Deployment and Ocean Test of the first unit. OPT will deploy a full scale PB150 PowerBuoy ("PB150B2") system in the Oregon Territorial Sea and collect detailed operating characteristics during 2 years of operations. These data will be used to validate the performance at that site.

Figure 6 *Making final connections during the PB150 installation*

As OPT pursues its commercialization strategy, the Lockheed Martin - Missions Systems and Sensors business unit has teamed with OPT in efforts to minimize the fabrication and assembly of OPT's 150kW PowerBuoy. Lockheed Martin is the largest United States defense contractor with a plethora of engineering and manufacturing resources as well as very structured and rigorous process development and improvement capabilities. Lockheed Martin will supplement OPT's capabilities with resources that are experienced in transitioning development models into production with a focus on process improvement.

For additional information on OPT's PowerBuoys, visit oceanpowertechnologies.com.

SingTel transforms maritime crew communication
Singapore Telecommunication Limited (SingTel) has announced a free maritime broadband offer and the launch of a new web portal that will allow crew members to keep up with the latest news and stay in touch with their friends, family, and co-workers. Called crewXchange@singtel, this one-stop portal (crew.singtel.com) allows users to subscribe to news feeds, access e-mails, and chat with their friends using various messenger platforms. This "lightweight" portal is available free of charge to all SingTel maritime broadband customers and optimized to cater to bandwidth limitation onboard vessels. To facilitate better communication among their own crew, companies can also set up their own private chat rooms. With SingTel's extensive maritime broadband network, it is estimated that almost 10,000 crew members will benefit from this community network by logging onto crewXchange@singtel from their laptops or devices while on the vessels (www.singtel.com).

ITC Global to acquire Broadpoint's satellite division
ITC Global, an international provider of satellite communications services to the mining, energy, and maritime industries, has entered into a definitive agreement to acquire the satellite operations of Broadpoint LLC, an established provider of communications services to the oil and gas sector in the Gulf of Mexico. Broadpoint will retain its core cellular telecommunications business, which operates the only ubiquitous cellular voice and data network in the Gulf of Mexico. The acquisition brings together complementary and valuable capabilities, providing immediate benefits to both organizations. Broadpoint customers will be able to access ITC Global's worldwide coverage footprint and support services, which is critical as oil and gas exploration increasingly takes place in emerging markets such as West Africa and the North West Shelf of Western Australia.

The Shipping Corporation of India selects Stratos
Stratos Global has been selected by The Shipping Corporation of India Ltd. (SCI) to deploy the Inmarsat FleetBroadband satellite communications service as part of an integrated maritime communications solution that will help the operator increase productivity and control costs. Stratos was selected by SCI through Stratos' Channel Partner, Station Satcom. Based in Mumbai, SCI is India's largest shipping company, with an expansive fleet that operates globally and includes tankers, bulk carriers, liners and supply vessels. In addition to deployment of FleetBroadband on the entire fleet of 156 ships owned and managed by SCI, the Stratos solution includes:upgrades to AmosConnect 8, Stratos' sophisticated new maritime communications software; upgrades to crew communications via Stratos' new AmosConnect CommCenter application; and deployment of Blue Ocean Wireless (BOW) GSM service.

Ex-Im Bank finances sale of satellites to Inmarsat
The Export-Import Bank of the United States (Ex-Im Bank) is providing a $700 million long-term direct loan to finance the sale of satellites by Boeing Space and Intelligence Systems in El Segundo, California, to Inmarsat, a global provider of mobile satellite communications services to the maritime industry. The transaction is the largest satellite financing in Ex-Im Bank's history. The Bank's support helped Boeing Space and Intelligence Systems win the contract over competition backed by a foreign export-credit agency. Ex-Im's 8.5-year, fixed-rate loan will finance three Boeing Ka-band 702HP satellites for the Inmarsat-5 project and related launch insurance. The Inmarsat-5 satellites will operate in geosynchronous orbit with flexible global coverage and enable Inmarsat to meet the growing demand for mobile satellite services in the maritime and energy sectors.

Scorpio chooses Marlink's WaveCall service

Marlink has recently entered into a new 5-year contract with Scorpio Ship Management s.a.m., the technical arm of the Scorpio Group. As part of the new agreement, Marlink will deliver, install, and operate its cutting-edge WaveCall™ VSAT solution aboard 17 vessels, providing high-quality, reliable connectivity to support a wide range of applications including vessel management and crew welfare.

Marlink's WaveCall™ solution will provide each Scorpio vessel with 128 Kbps to 1024 Kbps for shore-to-vessel communications and 128 Kbps to 256 Kbps for vessel-to-shore communications. Each tanker will have access to 1 data and 2 voice lines for business administration and crew use. In addition, Marlink will supply FleetBroadband 250 and Iridium services to Scorpio to ensure further reliability and redundancy of the communications services aboard, including during emergency.

Marlink's extensive product range for the transportation industry includes its own regional, multi-regional, and global Ku-band and C-band Maritime VSAT systems @SEAdirect™, WaveCall™, and Sealink™ as well as on-demand services such as Inmarsat FleetBroadband, Iridium, and Thuraya. The maritime satellite communications provider has also established regional customer service facilities in major regions of the world, supporting its global customer base.

For more information, visit www.marlink.com.

IsatPhone Pro available with data capability and AmosConnect 8.2

Stratos Global announced that data service on Inmarsat's popular new IsatPhone Pro handheld satellite phone is now available with Stratos' recently released AmosConnect 8.2 communications application.

IsatPhone Pro's new circuit-switched global data capability of 2.4 kbps enables users to access e-mails, jpegs, documents, or PDFs. The compression capability inherent in AmosConnect 8.2 enables transmission speeds of more than 20 kbps for certain file types.

Since managing the first-ever IsatPhone Pro activation in July 2010, Stratos has activated more than 4,000 of the units for first responders, journalists, oil & gas workers, and government officials worldwide who require reliable, high-quality voice connectivity in the most remote locations.

The AmosConnect 8.2 portal brings all ship-relevant data to one central information page. The sending of reports and the receipt of weather updates and company news can be achieved within the same interface. With this new version, all service settings are remotely configurable from a central office. This functionality greatly reduces implementation and support time.

The foundation of The Stratos Advantage is Stratos Dashboard, which enables customers to manage their use of satellite airtime by providing real-time information on voice and data traffic used with associated costs. Stratos Dashboard further enhances the user experience of IsatPhone Pro by providing instant provisioning as well as rebilling and reporting options to minimize unexpected invoices and potential financial risk. Stratos Dashboard supports both post-paid and prepaid rate plan options.

For more information, visit www.stratosglobal.com.

Santander teleport in Spain completed

MTN Satellite Communications (MTN), the global provider of communications, connectivity and content services to remote locations around the world, and ERZIA, the leading provider of VSAT maritime communications in Spain, announced that their joint venture to develop a teleport in Santander Spain has been completed and is officially open. It now serves as a centralized gateway for MTN's VSAT communications with coverage over the Americas, Europe, and Asia. The facility is located in Santander, North Spain at 43° 27'46"N, 3° 48'18"W.

The new facility is one of the first in the world to provide C- and Ku-band commercial service as well as secure X-band service for government customers at a single location. The Santander teleport can see all of the satellites in the GEO orbit from 60W to 65E, covering a region from Western Australia to North America, the Mediterranean Sea, and the Indian and Atlantic Oceans. Importantly, the new teleport is strategically located in the intersection of the coverage of Xtar satellites, therefore able to uplink and downlink from both X-band satellites.

The Santander teleport provides a significant improvement in network efficiency, reliability, and customer service that augments the MTN worldwide infrastructure of redundant teleports and dedicated fiber optic links. In addition, it has a fully manned 24/7 network operations center providing European time zone coverage and local language operators to deliver quality service to global customers.

For more information, visit www.mtnsat.com.

Research fleets choose KVH's mini-VSAT Broadband

Crews aboard maritime research support vessels have a difficult job – providing security and mission management services to their fleets in waters around the globe. To make that job a little easier and help crew members stay in touch with family and friends, companies like Storm Offshore AS are deploying the TracPhone® V7 satellite communications solution from KVH Industries, Inc. Storm Offshore crew members use the reliable, affordable mini-VSAT Broadband service to communicate with the home office, file required paperwork in international ports, and stay in touch with loved ones back home.

The mini-VSAT Broadband network was designed from the ground up to be the first next-generation maritime satellite communications solution. The global spread spectrum satellite network, built with ViaSat's patented ArcLight® technology, offers more affordable airtime, voice service and Internet access as fast as 512 Kbps (ship to shore) and 2 Mbps (shore to ship). More than 1,000 TracPhone V7 systems have been shipped in the 3 years since the product's introduction, making the mini-VSAT Broadband network the fastest growing maritime

VSAT solution. The company recently expanded its product offering with the new TracPhone V3, the world's smallest maritime VSAT system at only 14.5-in. in diameter.

For more information, visit www.kvh.com.

Maersk Tankers now fielding KVH CommBox

Maersk Tankers, a division of A.P. Moller Maersk AS, has chosen the CommBox™ Ship/Shore Network Manager from KVH Industries, Inc., to increase efficiency and lower communications costs aboard 70 vessels. This is in addition to 50 CommBox-equipped vessels that Maersk brought onboard with its acquisition of Broström tankers in 2010. Copenhagen, Denmark-based Maersk will utilize the CommBox network management solution onboard these 120 vessels for least cost routing and to coordinate file transfers, e-mail, and Internet access for both business and crew use.

KVH's CommBox technology provides outstanding network management to more than 900 vessels worldwide. This completely customizable solution includes dedicated shipboard network management hardware, network hub options for enhanced performance and network control, and versatile software applications that expand onboard communication capabilities and add valuable capabilities like least cost routing, roaming crew e-mail accounts, data compression, web caching, and security. The CommBox is designed to help any commercial operator get the most out of their onboard satellite communications solution, regardless of what service or services they use.

For more information, visit www.kvh.com.

Pacific Fibre appoints banks to handle financing
Pacific Fibre has appointed ANZ, Credit Suisse and First NZ Capital to lead fund raising for its new submarine cable system. The 5.12 Terabit per second, two fiber pair system, will connect Australia to the United States with submarine fiber optic cables via New Zealand. ANZ's mandate is to raise the debt portion of the $400 million project on a project finance basis and as lead arranger intends to provide a significant portion of the required financing while also arranging for other qualified Australasian and international banks to join in the financing.
(www.paci ficfibre.net).

Nexans wins umbilical contract
Nexans has been awarded a 4.8 million euro contract by Norske Shell to supply the 6.5km infield umbilical for the Ormen Lange North Field project. The natural gas field on the Norwegian Continental Shelf started production in 2007. This Ormen Lange project will add a fourth subsea production template (template C) around 6km to the north of the existing main production area that contains three templates (A, B, and D). The Nexans infield umbilical will be used to tie template C back to template B by supplying the hydraulic fluid, electrical power, and fiber optic signals required to operate the subsea production systems located at a water depth of approximately 850m. Nexans is in charge of the engineering, procurement, and construction of the infield umbilical, which will be manufactured at its specialized plant based in Halden, Norway. It is scheduled for delivery in the first half of 2012 (www.nexans.com).

Global Nexus awards contract to SubCom
Global Nexus Telecommunications, a new provider of wholesale telecommunications capacity, and TE SubCom (SubCom), a TE Connectivity Ltd. company and an industry pioneer in undersea communications technology, has announced the signing of a supply contract for phase one of the Global Nexus Cable System. Phase one of the Global Nexus network will provide low-latency, resilient and diverse, ultra high capacity rates between Canada and the Bahamas, with onward connectivity to the USA and Latin and South America; it will serve as a catalyst to mesh hemispheric and regional networks. The system will be initially deployed with advanced 40GBit/s transmission technology and is designed to be compatible with SubCom's 100GBit/s transmission equipment. The system itself will be delivered under a 19-month program.

USVI power cable approved
Plans for a submarine power cable linking the U.S. Virgin Islands of St. Thomas and St. John has been approved by local authorities, making it possible for Virgin Islands Water and Power Authority (WAPA) to move forward with the project. The St. Thomas Coastal Zone Management Committee approved WAPA's plans to install the new cable, which will provide redundancy to the St. John's electricity supply. Two power cables currently connect the islands, but one is reaching the end of its active life and needs to be replaced. The new 34.5kV cable will have a full-load capacity of 22 to 27MW of power, which is more than double St. John's current peak demand of 10.5 MW. The cable will cost about $3.3 million and will be about 3 miles long. It will include optical fibers for telecommunications applications.

SubCom demonstrates new 4-port branching unit

TE SubCom (SubCom) has successfully completed testing of its new 4-port branching unit (BU) making it the first undersea communications supplier to offer the solution and paving the way for the deployment of multilayered undersea telecommunication networks.

An upgrade from the standard 3-port BU, the 4-port BU is capable of handling three separate power paths and enables alternative powering configurations. In testing, SubCom integrated two 4-port BUs with a variety of armored and unarmored cables as part of separate systems. The company completed two comprehensive sea trials in shallow water and deep water and confirmed the successful deployment, sea-bed placement, and recovery of the 4-port BUs using standard shipboard equipment.

Adding to SubCom's unique and flexible offerings, the 4-port BU provides the enhanced ability to develop customized solutions for a wide range of uses and customers. SubCom plans to use the product in new installations, upgrades, and extensions to existing systems.

For more information, visit www.subcom.com.

AfDB funds Seychelles cable project

The Board of Directors of the African Development Bank (AfDB) has approved a US$12 million senior private sector loan to finance the Seychelles East African System (SEAS), a submarine fiber optic cable linking the island of Seychelles to mainland Africa.

The SEAS project will be co-financed by the European Investment Bank, and equity contributions split between the three shareholders: Seychelles government, Cable and Wireless Seychelles, and Airtel.

The project entails engineering works, sea survey, construction, and roll-out of a submarine optical cable system and associated equipment to link Seychelles (Victoria, on Mahé Island) to Tanzania (Dar-el-Salam). The system comprises a pair of optical fibers as well as termination equipment at both ends. It is configured to provide 32 wavelengths, allowing a maximum throughput of 320 Gbps. From Tanzania, Seychellois telecom operators will have access to international connectivity.

The project is aligned with the Seychelles' National Information and Communication Technology Policy established in 2007. It is also consistent with AfDB 2008-2010 ICT and regional integration strategies, which recognize the crucial role played by infrastructure in supporting intra-regional and global trade as well as market integration. Finally, as the Bank's first Public-Private Partnership project in Seychelles, SEAS is consistent with AfDB objective to diversify its private sector operations.

For more information, visit www.afdb.org.

Omani carrier lands its first submarine cable

Nawras celebrated the successful landing of its first submarine fiber optic cable in the Sultanate of Oman. Senior members of the Nawras family joined representatives from Tata Communications for this milestone event, which saw the Tata Global Network (TGN) cable in the Persian Gulf connected to the Nawras network by TE SubCom.

This new cable link will be fully functional before the end of 2011. It will be used to route traffic from Nawras customers in Oman to Mumbai, India and onward to the rest of the world, via the Tata Global Network.

The cable is part of the company's strategy for international connectivity, which means further cost efficiency improvements while offering customers faster speeds and more choice in data services. Nawras is already serving many of the major corporate players in Oman. The new cable will offer enormous capacity for broadband and high-quality voice services and the company is now on the verge of being able to enhance its different services.

The TGN-Gulf project landing parties are Nawras, Bahrain Internet Exchange, Qatar Telecom, Mobily (Kingdom of Saudi Arabia), and Etisalat (United Arab Emirates).

For more information, visit www.nawras.om.

ASC commences Australia-Singapore cable project

Alcatel-Lucent and Australia-Singapore Cable International Limited (ASC International), a specialist submarine cable owner and sponsored by Leighton Contractors Telecommunications, have signed a contract worth several million U.S. dollars, to build a 4,800km multi-terabit submarine cable system with an option for 100 Gps transmission. The new system will link Perth, Australia to Singapore, providing the first open access high-speed connection from Western Australia to South East Asia.

Commercial operation of the network is planned to start in 2013. It will enhance the reach and capacity of ASC International's service offering to meet its customers' bandwidth demands for high-performance data networking services, while supporting traffic growth driven by smartphones and cloud computing applications. Providing around 8 times more capacity than similar regional routes, this new submarine cable system will fill the much needed gap in the market place connecting Australia to Asia.

The system design has an ultimate capacity of at least 6 Tbps and potentially over 16 Tbps with the 100G option. From Perth, traffic will be transported across terrestrial infrastructure, to provide competitive wholesale backbone services in Australia. ASC International will potentially deliver the first end-to-end submarine and terrestrial infrastructure capable of supporting 100G speeds with end-to-end services from Singapore to Sydney.

Delivered on a turnkey basis, the system will integrate Alcatel-Lucent cable,

repeaters, branching units, power feeding equipment and the 1620 Light Manager (LM) submarine line terminal initially equipped with advanced coherent 40G technology. Also, the Alcatel-Lucent 1620 LM is designed to accommodate 40G and 100G wavelengths in the same platform, enabling seamless capacity upgrade without traffic interruption.

For more information, visit www.leighton.com.au or www.alcatel-lucent.com.

Lime, Xtera deploy Caribbean East West Cable

Xtera Communications, Inc., a leading global provider of optical networking solutions, and LIME, the Caribbean arm of Cable & Wireless Communications (CWC), have successfully completed the installation of the Caribbean East West Cable network.

The 1,700km multi-million dollar submarine fiber optic cable connects Jamaica, the British Virgin Islands, and the Dominican Republic. The ultra-high bandwidth transmission system reinforces LIME's position as the Caribbean's premier wholesale capacity provider of voice, data and evolving media-rich services.

The undersea cable will also enable LIME to meet the rising demand for high-speed bandwidth from consumers and business customers in the 14 Caribbean islands where the company currently operates. It facilitates the roll out of a slate of new fixed-broadband and mobile data services that LIME is currently developing for customers that require high-quality capacity support.

LIME entrusted Xtera with the planning, design, engineering, installation, commissioning, and project management of this submarine cable project. The network uses Xtera's NXT submarine line terminal equipment and associated management equipment to provide a Day 1 capacity of 120 Gb/s across the system and is capable of being upgraded to ultimately transport 720 Gbps using the supplied technology, with even higher values possible with future technology.

Xtera's NXT is a high-performance submarine line terminal supporting new deployments and providing significant capacity upgrades for existing systems. It can transport a variety of traffic types, such as Gigabit Ethernet and SONET/SDH at different line rates – in this case, some 2.5G interfaces were supplied to handle existing traffic. The NXT also extends the life of the initial investment, as it can provide high capacity with a relatively narrow bandwidth cable, a key requirement given LIME's imaginative reuse of existing cable.

For more information, visit www.xtera.com or www.cwc.com.

Caucasus Online, SubCom to upgrade Black Sea system

Georgian telecommunications provider Caucasus Online and TE SubCom have announced the signing of a contract to upgrade the Caucasus undersea cable system. The upgrade of the almost 1,200km system, which provides high bandwidth connectivity between Poti, Georgia and Balchik, Bulgaria, will be conducted in stages over the next several years.

In operation since the end of 2008, the Caucasus Cable System has successfully served Georgian markets by providing direct access to Western Europe via a state-of-the-art undersea fiber optic link. SubCom's flexible upgrade solution will enable Caucasus Online to enhance its services, as needed, through boosted international capacity.

The Caucasus Cable System is comprised of a two-fiber-pair, point-to-point link connecting the main Georgian port of Poti with the Bulgarian coastal city of Balchik. It has an ultimate design capacity of 1.2 Tbps. A staged upgrade plan allows for the addition of 10 Gbps wavelengths, using technology installed in the original system.

For more information, visit www.subcom.com.

Vanuatu to join the world's fiber optic Internet backbone

Interchange Limited, a Vanuatu-based company, and Alcatel-Lucent have signed a landmark agreement to deploy Vanuatu's first international submarine cable system linking Port Vila, Vanuatu to Suva, Fiji. Scheduled for completion in mid-2012, this new system will deliver faster, more efficient, and cost-effective Internet connectivity to the Pacific island nation, while removing the current dependence on satellite and strengthening Vanuatu's competitive position as an e-business hub.

Interchange will construct, own, and operate the 1,230km submarine fiber optic cable system, which will link directly into the high capacity Southern Cross Cable between Sydney and Hawaii, enabling Vanuatu businesses to connect to global telecommunications highway via U.S., Australia, Asia, and Europe.

Initially equipped for 20 Gbps data transfer, which is over 200 times Vanuatu's current capacity, the new submarine cable system is designed with an ultimate capacity of up to 320 Gbps to support the continued growth of Vanuatu's e-business economy well into the future. Its deployment will increase Internet speeds for new and existing Internet service providers and deliver the lower cost capacity that Vanuatu needs to encourage economic growth and support its burgeoning tourist industry.

At a cost of US$30 million, the submarine cable project is largely funded by the private sector. However, the government of Vanuatu has shown strong support for telecommunications infrastructure project, with Vanuatu Post coming forward as a seed investor in Interchange Limited. The Vanuatu government has also committed to the pre-purchase of capacity to enhance the utility of the e-government network by extending it internationally.

Interchange Limited has secured an option with ASN for the extension of the system from Vanuatu to Noumea. This extension would enable connectivity for New Caledonia to Fiji as well providing Vanuatu with diverse cable outlets.

For more information, visit www.alcatel-lucent.com or www.interchange.vu.

Telkom lands WACS at Yzerfontein

Telkom South Africa has successfully landed the ultra-high capacity West African Cable System (WACS) linking Southern Africa and Europe at a new landing point in Yzerfontein in the Western Cape of South Africa.

Once WACS commences commercial operation, Telkom will be able to provide services through three diverse gateways from South Africa, providing the redundancy for a connected South Africa even under disastrous conditions.

The 14,000km fiber optic submarine cable system will effectively raise South Africa's current broadband capacity by over 500 Gbps.

Spanning the west coast of Africa and terminating in the United Kingdom, WACS will enable seamless connectivity into the rest of Europe and America.

Designed to support present and future Internet, e-commerce, data, video and voice services, the capacity of the entire system is 5.12 Tbps. The system makes use of dense wavelength division multiplexing (DWDM) technology, which enables bidirectional communications over one strand of fiber, as well as the multiplication of capacity.

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

ABB wins $20M subsea power cable order

ABB, the leading power and automation technology group, has won an order worth about $20 million from EMAS AMC, the deepwater services arm of Ezra Holdings Limited, to supply power cables for Statoil's Gudrun North Sea oil and gas field, located off the coast of Norway.

ABB will deliver 55km of 52kV, three-core submarine cable with integrated optical fiber, which will facilitate the supply of 20MW of electrical power from Statoil's Sleipner fields to the Gudrun field. The cable is designed to accommodate additional connections as required.


Photo: Kjetil Alsvik / Statoil

The installation will be carried out by EMAS AMC commencing in the third quarter of 2013 to enable oil and gas production at Gudrun, which is scheduled to begin in 2014.

For more information, visit www.abb.com or www.statoil.com.

Prysmian secures contracts for special cables

Prysmian Cables & Systems, world leader of the energy and telecom cables and systems industry, has signed two major contracts with SAIPEM, a world leading oil and gas industry contractor, worth in excess of €60 million, to supply special cables for applications in the oil, gas, and petrochemicals industry.

Prysmian will supply a wide range of power, instrumentation, and fiber optic cables specially designed for process plant and sulfur recovery units for treating natural gas at the Shah Arab Field in Abu Dhabi, United Arab Emirates and hydrocarbon resistant instrumentation and signaling cables for the BS 171 oil booster station project in Kuwait. The two contracts are worth in excess of €50 million and €10 million respectively. The cables will be produced in the Italian plants of Livorno Ferraris (Vercelli), Merlino (Lodi), and Ascoli Piceno, with delivery starting from May 2011.

For more information, visit www.prysmian.com.

Nexans wins contract from Statoil

Nexans has been awarded a 20 million euro contract by Statoil to design and manufacture the direct electrical heating (DEH) system for the subsea pipelines serving the new Fossekall Dompap oil and gas field on the Norwegian Continental Shelf. The Fossekall Dompap fields tie back to the Norne FPSO (Floating Production Storage and Offloading) where Nexans previously supplied DEH systems for pipelines to Urd and Alve.

The contract covers the delivery of a complete DEH system, including DEH riser cable with four power cores, armored feeder cables, a 25km piggyback cable, and all associated accessories for connection to- and installation on the pipeline that will connect the Fossekall Dompap subsea facilities with the Norne FPSO. The Piggyback Cable incorporates a new Integrated Protection System that has been qualified by Nexans to ensure protection from mechanical loads such as trawling.

Direct electrical heating (DEH) is a technology for flow assurance, developed to safeguard the wellstream flow through the pipeline to the platform. Alternating current (AC) transmitted from the DEH cable runs through the steel in the pipe, which heats up due to its own electrical resistance. This allows the pipeline to be operated in a cost efficient and environmentally safe manner.

The cables for the Fossekall Dompap DEH system will be manufactured at the Nexans factory in Halden, Norway, for delivery in April 2012.

For more information, visit www.nexans.com.

OMM to install Greater Gabbard array cabling

Offshore Marine Management (OMM) has recently secured a contract with Fluor for the installation and subsequent trenching of 29 inter-array cables at the Greater Gabbard wind farm 14 nm. from Felixstowe, East Anglia.

OMM will start work immediately on the 500MW Greater Gabbard Offshore Wind Farm project, which is the most prestigious cable installation project the company has been involved with and a great achievement for the rapidly expanding operation. Both OMM's independence and its unique approach to providing flexible solutions for projects are crucial to its on-going success.

Under its contract with Fluor, OMM will provide a full range of installation services, from front end pre-engineering support, burial trials, and installation of the inter-array cables to delivery of the final reporting using in-house survey capabilities.

For more information, visit www.offshoremm.com.

AXYS Technologies: 35 Years of Ocean Monitoring

For more than 35 years, AXYS has been designing, building, deploying, and maintaining a variety of marine buoy systems for weather, wave, and sea state forecasting.

History

The AXYS Technologies, Inc. (AXYS) legacy began with marine consulting contracts to Environment Canada for wave studies in 1974. This was followed by the design of several marine technology devices in the 1980s that led to an opportunity to design, manufacture, install, and service Canada's Marine Weather Buoy Network. Enhancements and improvements to these technologies have been an ongoing mandate in close collaboration with Environment Canada.

In the early 1990s, AXYS began producing additional marine technologies in collaboration with the National Research Council (NRC). One of the main outcomes was the TRIAXYS directional wave monitoring buoy. The NRC also assisted financially with the development of the next generation WatchMan500 controller processor.

TRIAXYS with Currents buoy deployment in the Faroe Islands for an open ocean fish farming research project

Over the last fifteen years, AXYS has continued to grow its marine product portfolio and increase market share with major buoy network sales in Italy, Colombia, Spain, Portugal, the United States, and Brazil. In recent years, AXYS has further diversified with the creation of hydrological products for freshwater monitoring, as well as teaming up with a third party to offer the world's first offshore wind resource assessment buoy.

AXYS has continued to improve its environmental monitoring systems over the last three decades. Performance enhancements have included testing new sensors, power supply and management systems, cabling systems and data acquisition systems. It is located in beautiful Sidney by the Sea in British Columbia, Canada and has recently completed construction of a brand new production and testing facility. This new building provides over 4,500 sq.ft. of additional manufacturing space, and another 4,500 sq.ft. of office space that will accommodate our growth for years to come.

Several AXYS 3 meter buoys await deployment

Products

AXYS designs, builds, deploys, and maintains a variety of marine products including moored buoys for weather, wave, and sea state forecasting, as well as buoys for specialized applications such as renewable energy resource assessment, tsunami, red tide, and oil spill detection. A typical buoy measures wind speed and direction, atmospheric pressure, air temperature, relative humidity, solar radiation, water temperature, currents, and directional waves. The AXYS WindSentinel is the world's first wind resource assessment buoy capable of accurately gathering wind data at turbine hub-height and across the blade span.

Hydrological applications include freshwater products for flood forecasting information systems, hydroelectric networks, irrigation management, environmental assessments, continuous water quality monitoring, and automated greenhouse gas monitoring.

WatchMate buoy gathers wave energy data off the coast of Vancouver Island

WatchKeeper buoy deployed off the south coast of Spain provides weather information to mariners

Core Technology

The AXYS WatchMan500™ controller was designed as the next generation of payload for marine systems to provide desktop to sensor monitoring and control, including dynamic onboard control and data storage capabilities. This controller is the ideal solution for any application requiring data monitoring, collection, control, processing, or remote system management. It can interface with custom or commercial off the shelf sensors, equipment, software, and telemetry.

Services

The AXYS Service Team has extensive experience in the training, commissioning, deployment and maintenance for operational buoy programs. AXYS technicians are capable of board level diagnostics/repair in the field, and individual electronic component level diagnostics/repair in the lab. The team handles client training that covers all aspects of buoy and systems assembly, function, installation, preventative and corrective maintenance, repair, testing, calibration, transmission protocols, data storage, data analysis, data presentation, and real-time data distribution.

AXYS can provide full turnkey installation programs for any of its products, anywhere in the world. Working with our clients and regional agents, it will coordinate the installation or service logistics required to ensure the installation or repair of AXYS systems.

AXYS also provides full data hosting and management services. These services range from receiving and hosting buoy data on a publicly displayed website, to sending detailed monthly reports on data throughput from buoys or other monitoring stations. Real-time notification alarms when specific parameters are exceeded are also included in the service.

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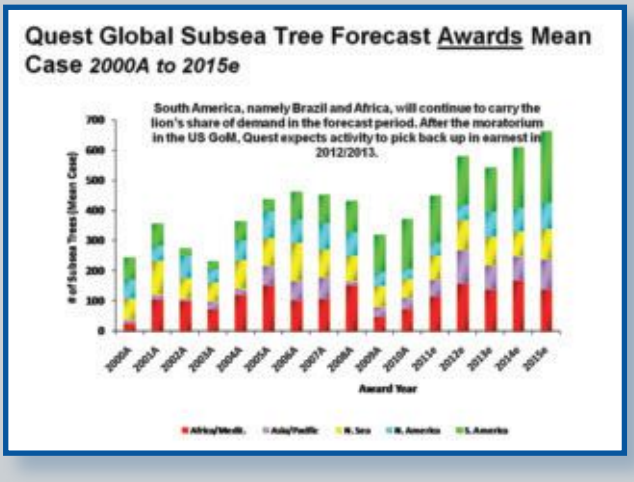
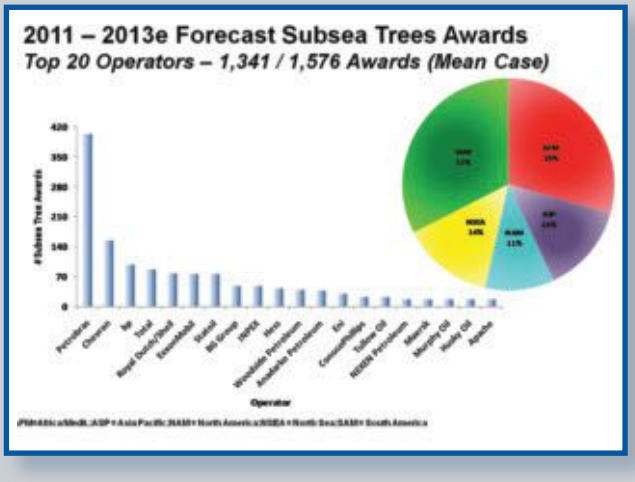
Offshore At-A-Glance

Quest Offshore Activity Report

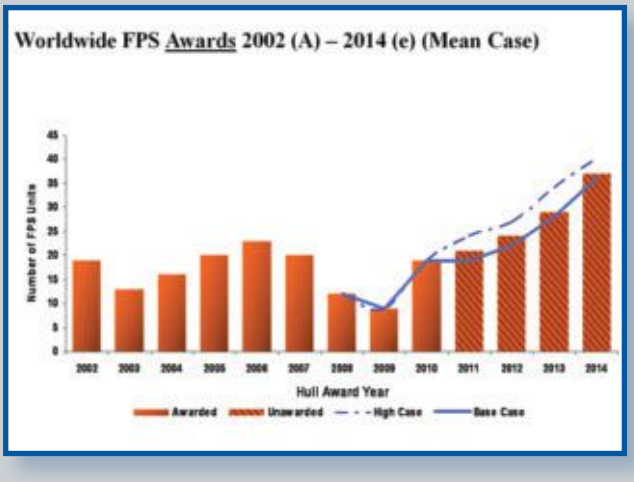
Global Subsea Tree Forecast



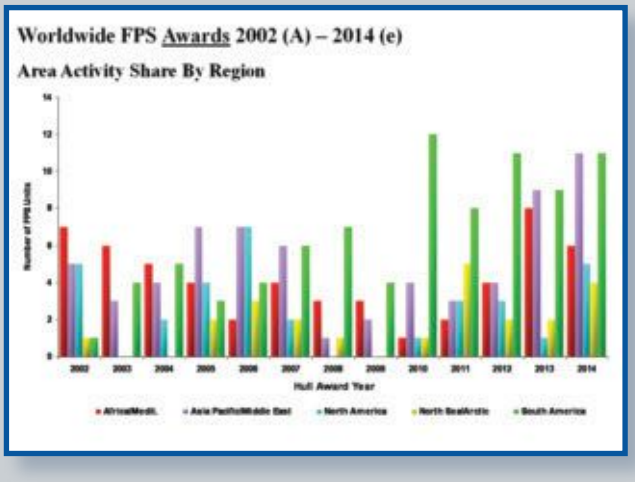
Subsea Tree Forecast Top 20 Operators



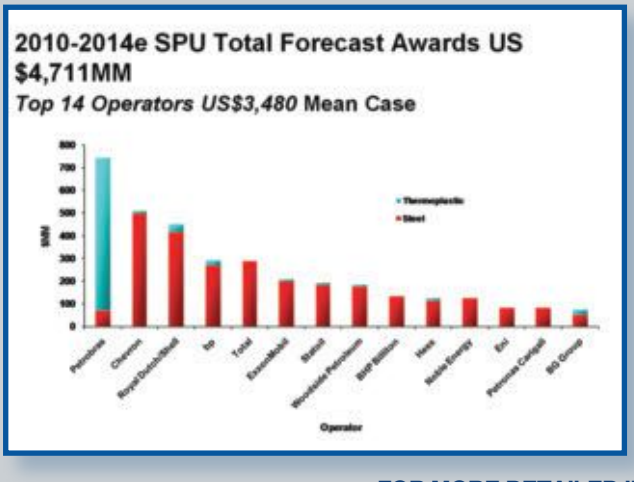
Worldwide FPS Awards



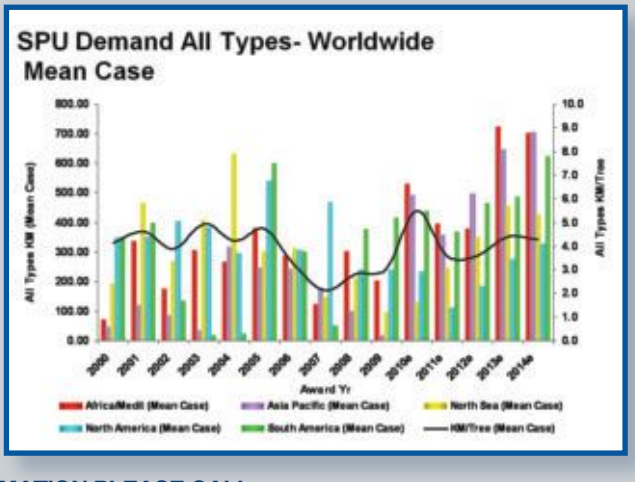
Worldwide FPS Awards by Region



SPU Forecast Top 14 Operators U.S.



Worldwide SPU Demand



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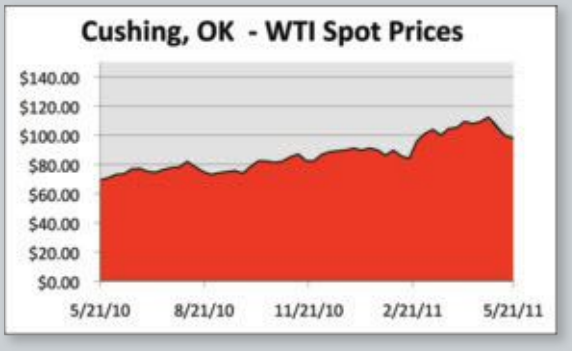
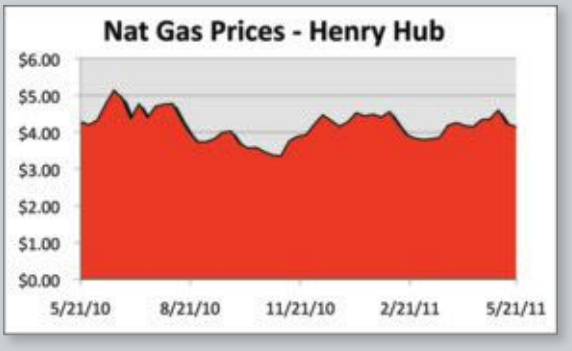
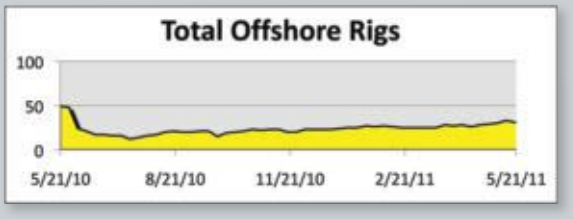
Oil & Gas Industry Trends

Monitoring the pulse of the US Offshore Oil & Gas Industry





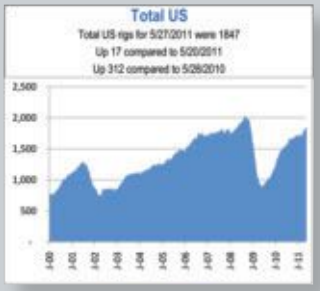


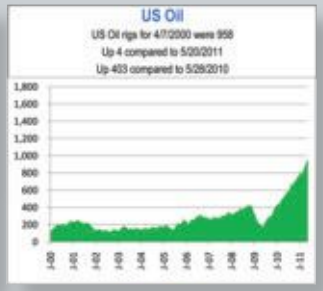
positive trend at least 3 weeks
changing trend < 3 weeks
negative trend at least 3 weeks

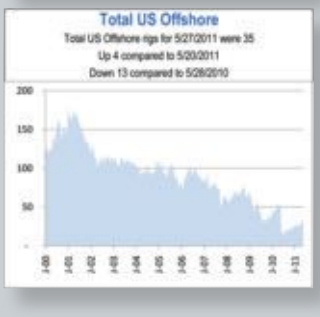
Baker Hughes Rig Report

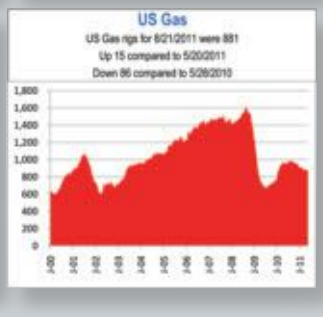
North American Rig Report
May 27, 2011

Location	Week of 5/27	+/-	Week Ago	+/-	Year Ago
Land	1796	15	1781	321	1475
Inland Waters	16	-2	18	4	12
Offshore	35	4	31	-13	48
U.S. Total	1847	17	1830	312	1535
Gulf of Mexico	35	4	31	-11	46
Canada	179	36	143	-12	191
N. America	2026	53	1973	300	1726









Gulf of Mexico Data

Current Deepwater Activity

Operator	Area/Block	OCS Lease	Rig Name	Prospect Name	Water Depth(ft)
Shell Offshore Inc.	AC 859	G20871	NOBLE DANNY ADKINS	Tobago	9,627
Shell Offshore Inc.	AC 857	G17565	H&P 205	Great White	7,813
Statoil Gulf of Mexico LLC	WR 969	G26419	T.O. DISCOVERER AMERICAS		7,813
Anadarko Petroleum Corp.	KC 875	G21444	ENSCO 8500	Lucius	7,103
ExxonMobil Corp.	KC 919	G21447	MAERSK DEVELOPER	Hadrian	6,941
Chevron USA Inc.	KC 736	G22367	T.O. DISCOVERER INSPIRATION	Moccasin	6,750
Noble Energy Inc.	MC 519	G27278	ENSCO 8501	Santa Cruz/Santiago	6,500
Eni US Operating Co. Inc.	MC 772	G24107	T.O. DEEPWATER PATHFINDER	Triton (mc)	5,413
Anadarko Petroleum Corp.	GC 726	G24184	T.O. DISCOVERER SPIRIT	Tonga	4,674
BHP Billiton Petroleum (GOM)	GC 654	G20085	T.O. DEVELOPMENT DRILLER I	Shenzi	4,383
Chevron USA Inc.	GC 640	G16770	T.O. DISCOVERER CLEAR LEADER	Tahiti	4,292
BHP Billiton Petroleum (GOM)	GC 653	G20084	GSF C.R. LUIGS	Shenzi	4,234
ATP Oil & Gas Corp.	MC 941	G16661	NABORS 202	Mirage	4,000
Shell Offshore Inc.	MC 809	G09883	H&P 204	Princess	3,800
Shell Offshoe Inc.	MC 516	G11528	CAL DIVE Q-4000	Serrano	3,800
Murphy E&P Co.	GC 338	G21790	NABORS MODS 200	Front Runner	3,325
Marathon Oil Co.	GB 515	G20792	DIAMOND OCEAN MONARCH	Ozona	3,287
Shell Offshore Inc.	MC 807	G07963	H&P 201	Mars b	2,945
Eni US Operating Co. Inc.	MC 460	G18244	T.O. AMIRANTE	Appaloosa	2,823
Shell Offshore Inc.	GB 427	G07493	NOBLE JIM THOMPSON	Auger	2,721
Chevron USA Inc.	GC 205	G05911	NABORS 85 (MAYRONNE 162)	Genesis	2,598
LLOG Exploration Offshore, LLC	MC 199	G32301	NOBLE AMOS RUNNER	MC 199	2,528
Energy Resource Technology	GC 282	G26302	DIAMOND OCEAN VICTORY	Boris	2,346
Walter Oil & Gas Corp.	VK 821	G27243	DIAMOND OCEAN SARATOGA	VK 821	1,030
Stone Energy Corp.	MC 109	G05825	H&P 206	Amberjack	1,030

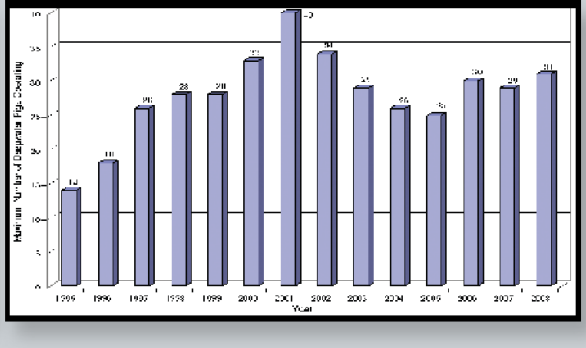
Deepwater prospects with drilling and workover activity: 25

Current Deepwater Activity as of Monday, May 16, 2011

Activity by Water Depth

Water Depth in Meters	*Active Leases*	*Approved Applications*	*Active*
0 to 200	*2,057*	*33,7784*	*3,240*
201 to 400	*136*	*1,108*	*21*
401 to 800	*314*	*833*	*10*
801 to 1,000	*402*	*509*	*7*
1,000 & above	*3,354*	*1,645*	*26*

Rig activity by year



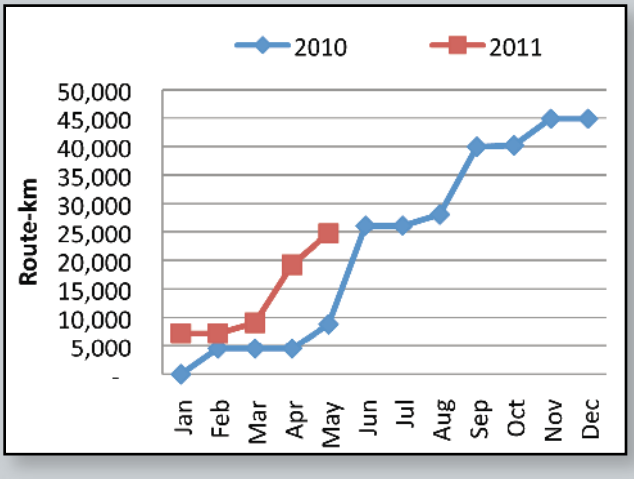
Activity by water depth Information current as of Monday, May 16, 2011

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.

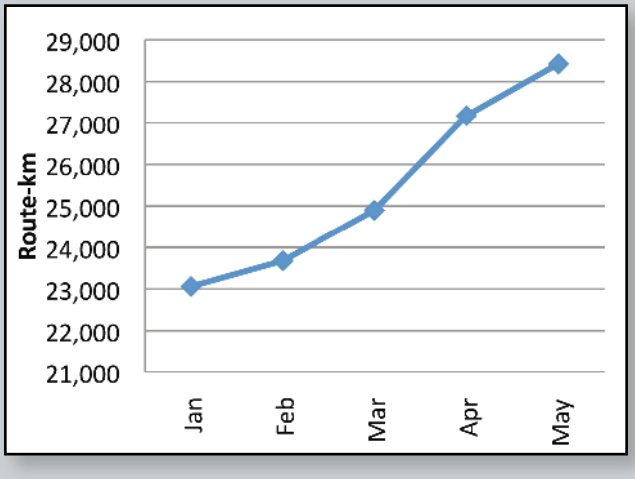
Information provided courtesy of the U.S. Bureau of Ocean Energy Management

Subsea Telcom & Power Cable Data

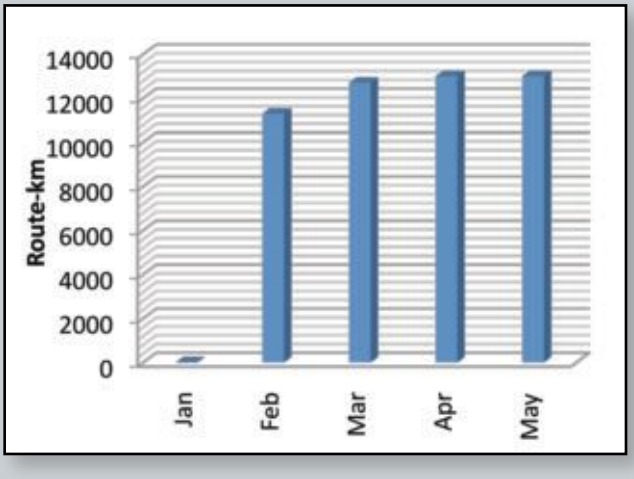
FO Cable Awards by month



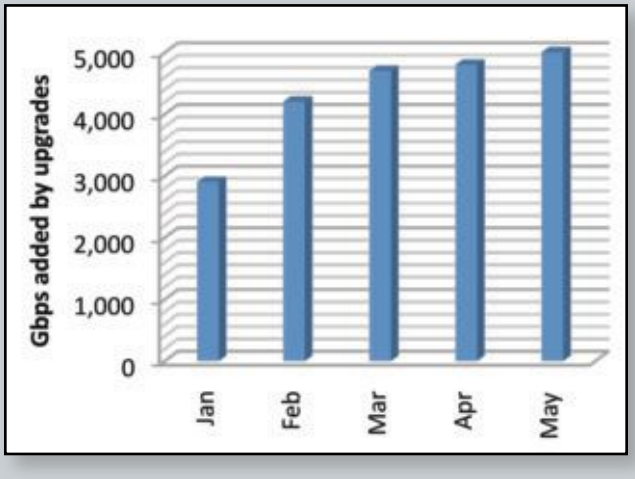
FO Cable Announcements 2011



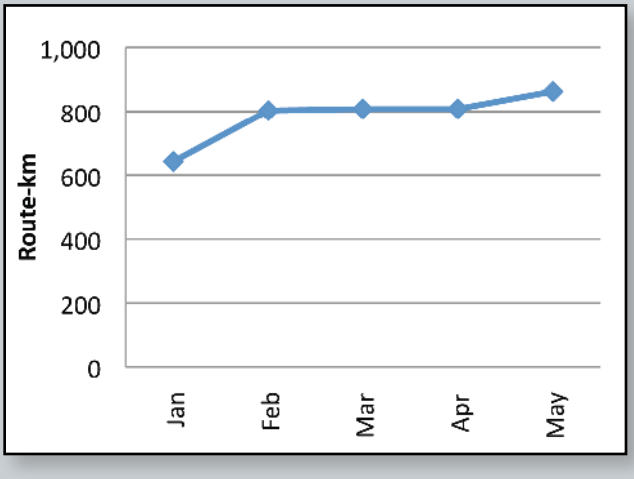
Submarine FO Cables Entering Service 2011 in route-km



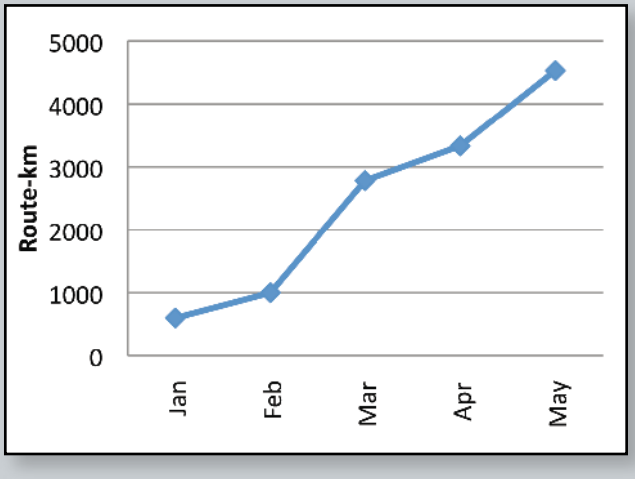
Upgrades of Existing Cable Systems in Gbps



Submarine Power Cable Awards 2011 in route-km



Submarine Power Cable Announcements 2011 in route-km



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Excerpts from

MUSINGS FROM THE OIL PATCH

By Allen Brooks, Managing Director

PARKS PATON HOEPFL & BROWN

ENERGY INVESTMENT BANKING, LP

From the April 26, 2011 issue

Ever wonder why wind power needs to be offshore?

At the recent annual meeting of the National Ocean Industries Association (NOIA) held in Washington, D.C., Bob McDonnell, governor of the Commonwealth of Virginia spoke about his state's push to develop its offshore energy resources – crude oil, natural gas and wind. Virginia was targeted to be the first state to hold an offshore oil and gas lease sale under plans that have since been scraped due to the Deepwater Horizon accident and resulting oil spill from BP Ltd.'s (BP-NYSE) Macondo well. As part of the offshore development plan, no activity would have occurred within 50 miles of the coast. This distance, while much greater than the curvature of the earth, assured residents that nothing associated with resource development could be seen from the shore. Out of sight; out of mind.

'Slow and steady' not acceptable to President Obama

Increasingly the Obama administration wants to push for greater development of "green" energy sources such as wind and solar, but is frustrated by the regulatory hurdles that developers need to clear. That is one reason why Secretary of the Interior Salazar has moved to reduce some of the requirements in order to speed up the permit approval time. His actions are often cited as the proper governmental response to the nine-year and counting road the Massachusetts Cape Wind power project has been traveling between initial license application and breaking ground for construction. Of course, long lead times for large energy projects, especially for those destined to be located in either challenging conditions and-or environmentally sensitive areas is nothing new. But "slow and steady," which is supposed to win the day is not acceptable to President Barack Obama who wants things approved quickly before opposition can muster strength and-or the economic weaknesses of the concept can be uncovered.

The key argument for putting wind power offshore is that the wind blows stronger and steadier there, along with the fact that there will be no visual pollution if the turbines are positioned more than 13 miles offshore, which is over the horizon. Onshore wind turbines increasingly are coming under attack, not only for their visual pollution but also for their noise and pinwheel light patterns impacting the neighbors.

Promises sold without understanding the impacts

In researching our story in the last issue of the Musings dealing with the recent report on Scotland's wind power business sponsored by the John Muir Trust in the UK, one of the sources of wind turbine data came from the Braes O'Doune wind farm. This is a 36-turbine wind farm that began operation in Feb. 2007 but like most in Scotland barely achieves anywhere close to the 30% of capacity performance over the course of a year wind energy proponents tout. The problem is that the promises of wind energy were sold to the public without much understanding of how the turbine towers would change the landscape.

When the Braes O'Doune wind farm began generating electricity, the performance of the wind power initiative of Scotland's Renewable Obligations Certificates scheme was praised by then Trade and Industry Secretary Alistair Darling who said, "This is a major landmark. Over the last 20 months, we have doubled the amount of wind-generated electricity we have." The wind farm was constructed at a cost of £72 million ($119 million), generated 150 construction jobs and produces 72 megawatts of power, enough to supply 45,000 homes in the area. Every household in Scotland, however, is subsidizing the electricity generated by these turbines through charges on their monthly electricity bills. The real tragedy is the visual damage done by the 328-foot tall turbines.

Wind farm's visual impact on historic Stirling Castle

The Braes O'Doune wind farm is located at the gateway to the Highlands that had become a tourist hotspot in recent years. Part of the attraction was the presence of one of the country's most historic sites, Stirling Castle. John Digney of the Scottish Wild Land Group, said, "There was a lot of opposition at the time, but the planning for this went through very quickly. People were genuinely shocked when they realized just how conspicuous it was. It is an eyesore. As you approach the city, this is your first glimpse of the Highlands and these turbines detract from the whole scene." He went on to state that the "industrialized development" was located in one of the "most stunning parts of the country" and it ruins the views of Stirling Castle.

Stirling Castle with view of 36 wind turbines

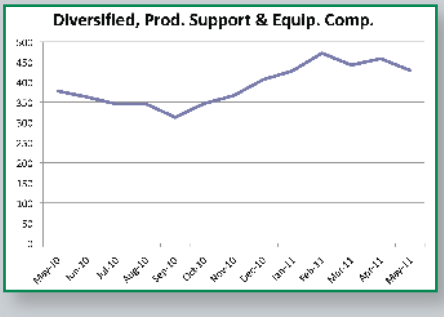
Stirling Castle was home to Mary, Queen of Scots, and is one of the largest and most important castles in Scotland. It is perched some 250 feet atop an extinct volcano, and was a favorite residence of the Stuart monarchs who ruled Scotland and England. Besides being the site of the crowning of Mary in 1543, it also offers views of some of Scotland's key battlefields, including Stirling Bridge, where William Wallace defeated the English in 1297, and Bannockburn, where Robert the Bruce dealt Scotland's southern neighbors a similar blow in 1314. The castle was last besieged in 1746, when Charles Edward Stuart, known as "Bonnie Prince Charlie," tried unsuccessfully to seize the castle.

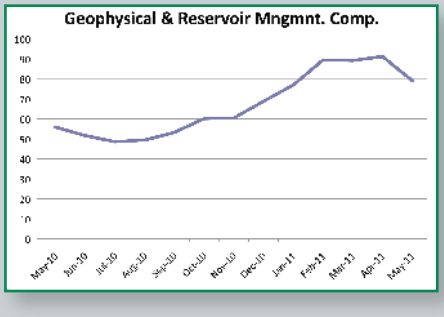
Energy association disagrees that farm is eyesore

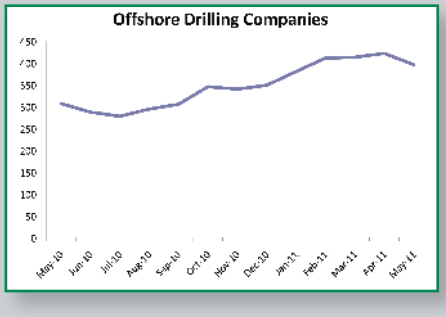
As one would expect, the British Wind Energy Association (BWEA) does not find any problem with the wind farm, and defends it by citing the construction jobs and power output. A BWEA spokesman stated, "We don't agree that the wind turbines are an eyesore. They are a feat of engineering and do not spoil the landscape. Wind energy will play a key role not only in mitigating the effect of climate change, but also in securing the energy future of this country."

We'll let you be the judge from the pictures above.

Monthly Stock Figures & Composite Index





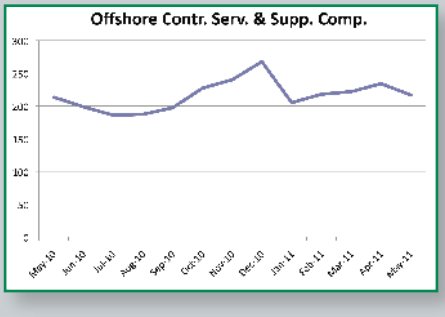


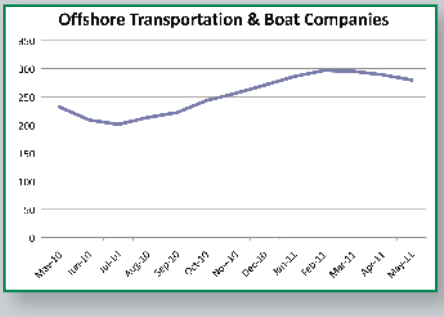
Industry Company Name	Symbol	Close *Mid-May*	Close *Mid-April*	Change	Change %	High 52 week	Low
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	71.04	73.75	-2.71	-3.7%	79.24	35.62
Cameron Intl. Corp.	CAM	48.01	54.83	-6.82	-12.4%	63.16	31.42
Drill-Quip, Inc.	DRQ	68.83	74.40	-5.57	-7.5%	83.80	40.38
Halliburton Company	HAL	47.05	49.68	-2.63	-5.3%	51.45	21.10
Tenaris SA	TS	47.61	49.53	-1.92	-3.9%	51.07	32.91
Newpark Resources, Inc.	NR	8.82	7.40	1.42	19.2%	9.91	5.12
Schlumberger Ltd.	SLB	83.61	87.65	-4.04	-4.6%	95.64	51.67
Superior Energy Services, Inc.	SPN	34.29	39.26	-4.97	-12.7%	41.65	18.02
Weatherford International, Inc.	WFT	19.38	21.27	-1.89	-8.9%	26.25	12.34
Deep Down, Inc.	DPDW	0.11	0.11	0.00	0.0%	0.29	0.05
Total Diversified, Production, Support and Equipment.....		**428.75**	**457.88**	**-29.13**	**-6.4%**	**502.46**	**248.63**
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	32.54	41.02	-8.48	-20.7%	50.81	20.05
Mitcham Industries, Inc.	MIND	13.58	16.00	-2.42	-15.1%	16.44	5.56
Compagnie Gnrale de Gophysique-Veritas	CGV	32.88	34.08	-1.20	-3.5%	38.12	16.42
Total Geophysical / Reservoir Management.....		**79.00**	**91.10**	**-12.10**	**-13.3%**	**105.37**	**42.03**
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	45.49	45.53	-0.04	-0.1%	46.92	23.71
Diamond Offshore Drilling, Inc.	DO	72.47	76.18	-3.71	-4.9%	81.19	54.70
ENSCO International, Inc.	ESV	55.76	56.89	-1.13	-2.0%	59.90	33.33
Nabors Industries, Inc.	NBR	26.60	31.94	-5.34	-16.7%	32.47	15.54
Noble Drilling Corp.	NE	40.48	43.18	-2.70	-6.3%	46.72	26.23
Pride International, Inc.	PDE	42.09	42.65	-0.56	-1.3%	44.19	21.51
Parker Drilling Company	PKD	5.72	7.20	-1.48	-20.6%	7.45	3.43
Rowan Companies, Inc.	RDC	38.95	41.86	-2.91	-7.0%	44.83	20.44
Transocean Offshore, Inc.	RIG	67.92	75.80	-7.88	-10.4%	85.98	41.88
Total Offshore Drilling.....		**395.48**	**421.23**	**-25.75**	**-6.1%**	**449.65**	**240.77**

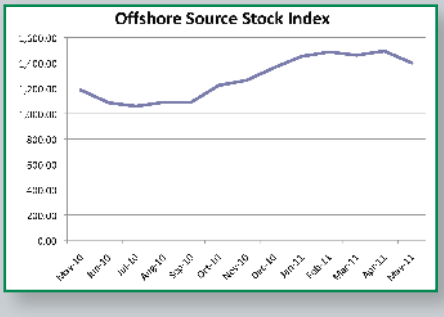
DISCLAIMER

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.

Monthly Stock Figures & Composite Index







Industry Company Name	Symbol	Close *Mid-May*	Close *Mid-April*	Change	Change %	High 52 week	Low
Offshore Contractors, Services and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	15.79	16.26	-0.47	-2.9%	19.20	8.38
Gulf Island Frabrication	GIFI	28.29	31.66	-3.37	-10.6%	35.85	14.18
Global Industries, Ltd.	GLBL	6.09	9.75	-3.66	-37.5%	10.23	4.05
McDermott International Inc.	MDR	21.15	22.98	-1.83	-8.0%	26.14	12.10
Oceaneering International	OII	81.28	85.68	-4.40	-5.1%	92.38	39.75
Subsea 7 SA	SUBC	25.00	25.91	-0.91	-3.5%	26.68	13.25
Technip ADS	TKPPY.PK	25.05	27.57	-2.52	-9.1%	28.35	14.16
Tetra Technologies, Inc.	TTI	14.18	14.18	0.00	0.0%	16.00	8.00
Total Offshore Contractors, Service and Support……..		**216.83**	**233.99**	**-17.16**	**-7.3%**	**254.83**	**113.87**
Offshore Transportation and Boat Companies							
Seacor Holdings Inc.	CKH	96.04	96.20	-0.16	-0.2%	116.00	67.01
Gulfmark Offshore, Inc.	GLF	39.44	40.22	-0.78	-1.9%	47.31	23.83
Bristow Group	BRS	42.51	43.99	-1.48	-3.4%	52.39	28.32
PHI, Inc.	PHII	20.00	23.10	-3.10	-13.4%	23.55	13.15
Tidewater Inc.	TDW	56.26	57.23	-0.97	-1.7%	63.55	37.99
Trico Marine Services, Inc.	TRMA	0.07	0.03	0.04	133.3%	1.61	0.03
Hornbeck Offshore	HOS	25.28	28.22	-2.94	-10.4%	31.77	12.63
Total Offshore Transportation and Boat ……..…….		**279.60**	**288.99**	**-9.39**	**-3.2%**	**336.18**	**182.96**
Total Diversified, Production, Support and Equipment		**428.75**	**457.88**	**-29.13**	**-6.4%**	**502.46**	**248.63**
Total Geophysical / Reservoir Management		**79.00**	**91.10**	**-12.10**	**-13.3%**	**105.37**	**42.03**
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Total Offshore Transportation and Boat		**279.60**	**288.99**	**-9.39**	**-3.2%**	**336.18**	**182.96**
Total Offshore Source Index…		**1,399.66**	**1,493.19**	**-93.53**	**-6.3%**	**1,648.49**	**828.26**

BMT qualifies ROV-serviceable subsea strain sensor

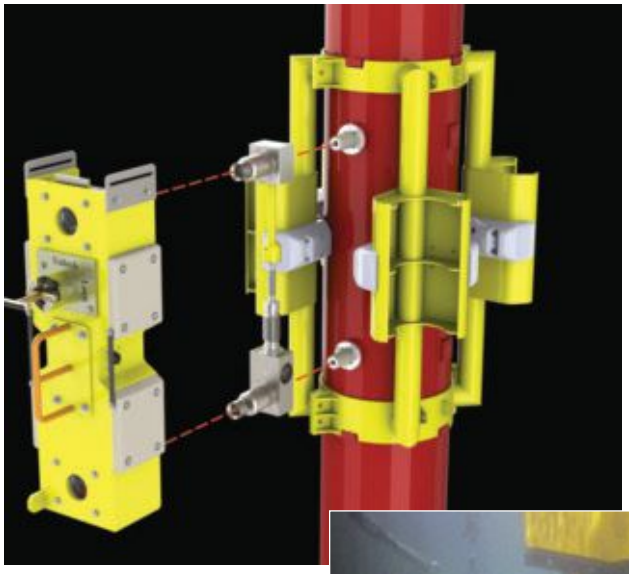
BMT Scientific Marine Services (BMT) has launched a fully qualified ROV-Serviceable Subsea Strain Sensor Assembly (SSSA) for monitoring the structural integrity of subsea structures (tendons, production risers, steel catenary risers, platform legs, and braces, etc).

Until now, sensors were limited to diver serviceability due to the finesse needed to handle them and the inability of an ROV to manipulate the standard nuts and bolts that hold sensors to the pipe. Due to the high cost and risk associated with mobilizing a diver spread to change-out a failed sensor, these systems have had to rely on redundancy, with multiple sensors deployed to achieve the system design life.

With the ROV-serviceable SSSA, Floating production storage and offloading (FPSO) and platform operators have the opportunity to benefit from an increased degree of system reliability and quicker, simpler replacement operations.

BMT has developed its existing diver serviceable strain sensor into one that is serviceable by ROV. This has been achieved by designing a special ROV tool and alignment cage for sensor removal or installation. The tool for handling the sensor mates with this cage, which is bolted to the riser or subsea structure and provides the precise alignment needed to attach the sensor repeatedly and accurately. The design is purely mechanical and is compatible with an ROV equipped with one 5-function and one 7-function manipulator. As long as the failed sensor is replaced in the presence of at least three functioning sensors, the absolute tension or bending moment measurement is preserved during and after the change-out operation.

Because significant changes had been made to the mounting and attachment architecture, BMT thoroughly tested the new design to make sure these alterations did not degrade the sensor's measurement accuracy. Laboratory testing demonstrated the full-scale accuracy of the sensor to be equal to that of the diver-serviceable designs. In addition, full-scale ROV tank testing has proved the ability of a typical work-class ROV to completely remove and replace a sensor repeatedly. The first 10 deliverable sensors have passed extensive factory acceptance testing at BMT's facility in California and are now ready for deployment.



For more information, visit www.scimar.com.

Balmoral unveils subsea test center

Subsea buoyancy, insulation and elastomer product specialist, Balmoral Offshore Engineering, announced the opening of its new test facility.

The Balmoral Subsea Test Centre, located at company headquarters in Aberdeen, offers a comprehensive range of procedures, including hydrostatic, mechanical, and laboratory testing and represents a multi-million pound investment for the company.

"Our R&D program is continually developing new materials for use at increasingly greater depths and in high pressure/high temperature (HP/HT) environments," said Jim Milne, chairman and MD at Balmoral. "This outstanding test facility plays a significant role in our quest to lead the subsea buoyancy and insulation market in terms of product technology and materials development. We have vessels that can test to sea water depth equivalents of 7,000m."

A custom-built pressure test vessel, 'PV6', thought to be the largest commercially available unit in Europe, forms the centerpiece of the new center. Installed vertically with an internal diameter of 1.83m, an internal length of 9m, and a maximum operating pressure of 6,000 psi, the vessel is fitted with penetration flanges to allow the connection of hydraulic and electrical lines.

Other tests carried out at the all-new center include uplift determination, water ingress, bulk modulus, compression, and creep. All equipment is fitted with or linked to the latest software to provide highly detailed results.

The announcement follows a recent decision by Balmoral to establish a manufacturing facility in Brazil. The new facility will service the South American market by providing locally manufactured deepwater buoyancy and insulation systems as well as elastomer mouldings, including bend stiffeners, restrictors, and cable protection.

For more information, visit www.balmoraloffshore.com.

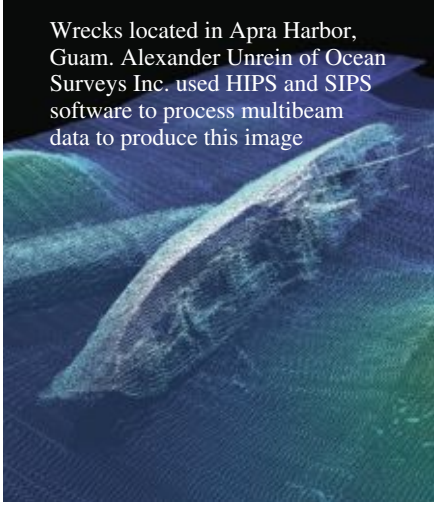
Processing efficiencies realized with latest HIPS and SIPS

CARIS, a world's leading marine GIS organization, has released a 64-bit version of its comprehensive hydrographic processing software HIPS and SIPS.

HIPS and SIPS 7.1 with 64-bit support will provide users who have access to a 64-bit computer with the ability to handle large multibeam sonar datasets even faster. This will provide organizations with significant savings in time, which is crucial for marine surveying organizations that wish to make efficiencies.

In-house tests revealed that the CUBE surface creation and Merge processes are now 15% to 30% faster, respectively. The 64-bit technology also allows access to larger banks of RAM, increasing the ability to multi-task while processing.

HIPS and SIPS supports over 40 sonar and LiDAR formats, allowing it to process data from virtually any system configuration. The software also includes the latest seafloor classification tools and workflows, enabling the optimum amount of information to be extracted from organizations' seafloor measurements.



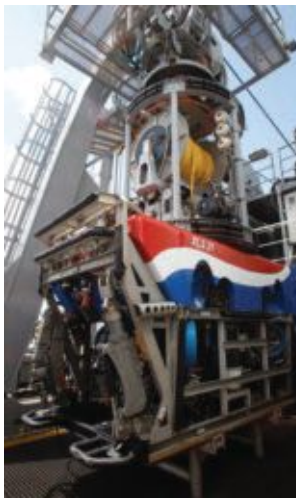
Wrecks located in Apra Harbor, Guam. Alexander Unrein of Ocean Surveys Inc. used HIPS and SIPS software to process multibeam data to produce this image

Corey Collins, HIPS and SIPS Product Manager, enthuses about what the latest release means to CARIS' clients: "With this release of HIPS and SIPS, we have listened carefully to what our clients have requested. They are telling the team here that support for 64-bit processing power is becoming a priority due to the increasing size of their sonar data. They are telling us that they want the most stable hydrographic processing application available on the market. We are happy that we are able to deliver on these priorities with the release of HIPS and SIPS 7.1."

For more information, visit www.caris.com/products/hips-sips.

Ashtead Technology Offshore launches Tritech Gemini Systems

Ashtead Technology Offshore is pleased to announce the addition of both the Tritech Gemini 720i and 720id Real-time Multibeam Imaging Sonars to the sophisticated rental fleet of sonar equipment in the Gulf of Mexico. Ashtead Technology brings the new Tritech Gemini systems to the rental market in the Gulf of Mexico, Canada, and as well as South and Central America. Both the swallow water Tritech Gemini 720i and deep water 720id real-time imaging sonars are in the region for immediate hire.



Chris Echols, Regional Vice President for Ashtead Technology Offshore was quoted as saying, "We firmly believe the Tritech Gemini product line is a technology that will greatly enhance the

ROV companies' sonar capabilities performing decommissioning and IRM inspections, no matter what water conditions exist. Tritech have made a solid product line for many years, and this system will stand up to the challenges faced before it offshore."

Considered one of the more advanced real-time imaging sonars in the industry, the 720i, swallow water unit has been on a long-term hire in the Gulf of Mexico for inspection activities with SURF Subsea onboard the SURF Challenger with other SURF contractors looking at the technology for their 2011 inspection campaigns.

David Rokohl, Project Manager for SURF Subsea states, "The Tritech 720i real-time imaging sonar has allowed us to provide our clients with imagery and clarity in waters that afford little to no visibility. The user interface allows a vast range of options that allow the operator to fine tune based on working conditions in the field. Integration is fluid, and its small, compact size creates a variety of mounting options in parallel to other equipment installed. Overall, SURF'S experience with the Tritech Gemini 720i has been well received."

FlashBack-2 puts to sea with RNLI

Ovation Systems FlashBack-2 digital recording system has been successfully deployed with the Royal National Lifeboat Institution (RNLI) to make dramatic video recordings of their daily rescue missions and routine training operations in some of the harshest sea conditions in the world.

The RNLI is a charity that provides a 24-hour lifeboat search and rescue service around the coasts of the UK and the Republic of Ireland.

The RNLI lifeboat crews, who are mostly volunteers, come from all walks of life, giving up their time and risking their lives to carry out rescues at sea in often dangerous conditions.

In 2008, the RNLI began to use the FlashBack-2 digital recording system to make video recordings of their operations at sea. The video is used for training purposes, but is also used in the important work of raising public awareness of the difficult work being carried out by the charity in saving lives at sea.

This is important because the organization receives no funding from the UK government, so it relies on charitable donations from members of the public and businesses to continue this vital work.

Waterproof belt worn by the RNLI crew

For this role, the FlashBack-2, which is a compact and rugged digital video recorder (DVR), has been combined with a side-mounted helmet camera. The system is connected to the camera with a specially designed cable and is carried with a battery in a plastic waterproof case mounted on a crew member's belt kit.

The RNLI now has over 300 Flashback-2 systems deployed at more than 230 lifeboat stations throughout the UK and Republic of Ireland.

FlashBack-2 was specifically designed for covert surveillance applications, but continues to show its versatility in a range of roles where video quality, compact size, and rugged constructions are key requirements.

FlashBack-2 utilizes broadcast standard MPEG-2 video compression to record high-quality real-time video and audio to one or two Compact Flash (CF) memory cards. Once a recording has been made, the flash cards may be removed and immediately viewed on a hardware CF media player or PC. As FlashBack-2 files are fully MPEG-2 compliant, standard applications may be used to view and archive recordings to disk or DVD. This compact and rugged recorder is DC powered and has stereo audio inputs at microphone or line level.

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

OceanWorks International and Harris Corporation form strategic alliance

OceanWorks International and Harris Corporation have signed a strategic alliance agreement to jointly pursue opportunities related to cabled ocean observing, subsea networking, and subsea power distribution equipment and services.

OceanWorks and Harris CapRock Communications have developed a modular seafloor communications and power distribution network that can be deployed in water depths up to 3,000m. The highly capable and customizable system provides telemetry, control, and power distribution infrastructure that allows customers to accomplish a wide range of environmental monitoring, infrastructure monitoring and distributed control solutions.

"OceanWorks is very excited to be part of this strategic alliance with Harris. Building on our individual strengths and our proven technologies, we believe that the new alliance will offer world-class integrated solutions to our oil and gas clients," said Glen Viau, chief operating officer, OceanWorks.

"Designing and operating ocean observing systems at great depths is a challenging endeavor, and we have found great success working with OceanWorks. They bring proven capabilities complementary to those of Harris," said Rick Simonian, president, Maritime Solutions, Harris CapRock Communications.

GAPS in good position as 100th unit leaves the factory

Unique System recently helped iXBlue achieve a highly satisfying commercial milestone. The equipment rental company's UAE office has just taken delivery of six GAPS portable, pre-calibrated USBLs – and among them, the 100th unit to leave iXSea's factory in Brest, France.

Harry Gandhi, CEO of Unique System, said, "GAPS is very popular with our customers in the UAE for two main reasons: the units perform well under adverse conditions – in shallow water and where there is excessive acoustic noise. Also, as they are pre-calibrated, they can be deployed and put to work quickly."

GAPS is unique in combining USBL, INS and GPS technologies in the same highly robust and versatile unit. As well as avoiding the need for calibration on-site, GAPS is the most accurate USBL in its class.

For more information, visit www.ixblue.com.

AEI selects Florida location to build tidal turbine blades

The Business Development Board of Martin County announces that American Energy Innovations has chosen to expand in Martin County, adding 600 new jobs over 5 years and making a $14.98 million investment in building and infrastructure.

The company was offered $435,000 in incentives from Martin County, with resources set aside as part of the Job Creation Toolkit in 2010. The State of Florida offered an additional $3.51 million, bringing the total incentive package to $3.945 million.

American Energy Innovations is committed to becoming a world leader in the alternative energy market, with a focus on water turbine blade technology. From its innovative composite blade processing techniques to a strategic location on the waterfront, AEI is uniquely positioned to capitalize on the tremendous electrical generating capacity of the Florida Current (also known as the "Gulf Stream") as well as tidal zones and river currents.

L-3 Klein demonstrates UUV-3500 at Ocean Business

L-3 Klein Associates, Inc. unveiled its newly released UUV-3500 side scan sonar, designed specifically for unmanned underwater vehicles (UUVs), at the Ocean Business conference held 5 to 7 April in Southampton, UK. The L-3 exhibit featured live, on-water demonstrations that showcased the UUV-3500 system's superior advances in range and resolution capabilities, which surpass those of legacy single-beam UUV side scan sonar systems.

The technology improvements in L-3 Klein's UUV-3500 will allow UUVs to cover more area in less time, while still providing highly detailed bottom imagery. The system's 445kHz and 900 kHz frequencies provide extended range capabilities and higher resolution that dramatically increase coverage rates in resolution-intensive applications such as mine countermeasures (MCMs). In addition, the UUV-3500 consumes extremely low levels of power, significantly extending the available mission time of underwater vehicles.

"Our UUV-3500 was extremely well-received at Ocean Business 2011," said Garry Kozak, technical sales engineer for L-3 Klein. "We are consistently achieving high-resolution imaging out to 75m or 80m or more using 900kHz. That's a good 50% improvement over anything else available in the marketplace, and we are very pleased to offer such a robust capability to our customers."

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

Mooring Systems launches new 400-tonne mobile spooler

Mooring Systems Ltd has launched what is believed to be the most adaptable offshore, mobile spooler of its kind in the UK—offering significant advantages for clients operating in the oil and gas and renewables markets.

The spooler, which was designed and built by Caley Ocean Systems at East Kilbride, has been transported to Mooring Systems' warehouse and quayside facility at Montrose on the east coast of Scotland.

The new 400Te capacity spooler has been designed to accommodate

a wide range of flexible products, including umbilicals, dynamic risers, marine hoses, and cables. It is capable of delivering almost 20km of 100mm cable in one batch. Its modular design can quickly be dismantled and loaded onto road transport – greatly improving its viability for offshore projects that can sail from any port in the UK at short notice.

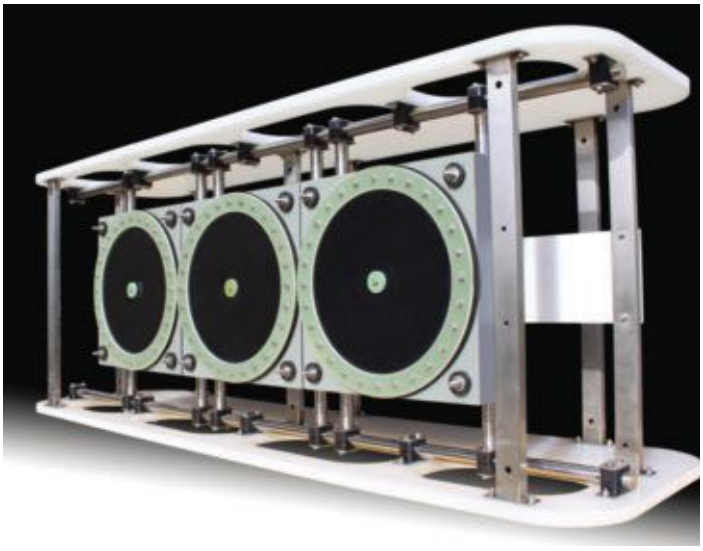
Designed in accordance with the latest Lloyds Register rules for lifting appliances in a marine environment, Mooring Systems' offshore product storage unit is suitable for lifting with the hose or cable pre-loaded. The carousel is supplied with a fully integrated hydraulic power pack and controls, all rated IP56, suitable for a marine environment.

The modular nature of the design means that many of the components used to build the spoolers are consistent across Mooring Systems' range, from 16Te to 400Te.

For more information, visit www.mooringsystems.com.

Applied Acoustics' new S-Boom delivers triple power

By harnessing the combined power of three of their AA202 Boomer Plates to provide a single pulse, the Applied Acoustics' S-Boom System is re-defining the boundaries of shallow seismic surveying. Already recognized for producing high-resolution seabed profiles, the fusion of these three transducers delivers a source level high enough to significantly increase sub-bottom penetration without loss of data quality.



Capable of operating at a maximum energy setting of 1000 Joules per pulse, and firing at three pulses per second, the S-Boom has achieved penetration results of over 200mS through sand and limestone while delivering the high quality resolution records expected from boomer systems. The high repetition rates and pulse stability allow for faster surveying, adding to the system's overall versatility.

As with all Applied Acoustics' sub-bottom systems, the S-Boom forms part of a modular package able to operate from a number of energy sources from the renowned CSP range. For optimum results, the fast-charging CSP-S1200 power supply has been designed as the energy source of choice for this system, although the system can operate just as well with a source from the larger CSP-S range. Furthermore, some existing variants of the CSP-D range can also be used at lower settings and longer pulse intervals.

For more information, visit www.appliedacoustics.com.

Ocean News & Technology

2011 EDITORIAL CALENDAR

January/February
Editorial: Inspection & Light Work Class ROVs, Offshore IRM
Distribution: Underwater Intervention
Deadline: January 14th
Product Focus: Diving Equipment & Buoyancy Materials

March
Editorial: Defense & Naval Systems, Oceanography & Meteorology
Distribution: NACE • Future Naval Forces • Ocean Business • Offshore Survey
Deadline: February 18th
Product Focus: Navigation, Mapping & Signal Processing; U/W Batteries

April
Editorial: Offshore Technology, Maritime Security
Distribution: U.S. Hydro • OTC • Maritime Security Expo-EJ Kraus
Deadline: March 11th
Product Focus: Connectors, Cables & Umbilicals

May
Editorial: AUVs & Gliders, U/W Imaging & Processing
Distribution: Oceans '11 IEEE Spain • UDT Europe
Deadline: April 15
Product Focus: Cameras, Lights & Imaging Sonars

June
Editorial: Ocean Renewables, Ocean Observing Systems
Distribution: EnergyOcean11 • Sea Work Int'l • MAST France
Deadline: May 13th
Product Focus: Tracking & Positioning Systems

July
Editorial: Work Class ROVs, Subsea Fiber Optic Networks
Distribution: AUVSI
Deadline: June 17th
Product Focus: Subsea Tools & Manipulators, Seismic Monitoring

August
Editorial: Coastal Engineering, Aquaculture & Marine Resources, Offshore Mooring Systems
Distribution: Offshore Europe • Oceans MTS/IEEE
Deadline: July 15th
Product Focus: Buoys & Monitoring Instrumentation

September
Editorial: Offshore Wind, Subsea Telecom, Deepwater Pipeline Repair & Maintenance
Distribution: OTC Brasil • AWEA/Offshore Wind • MTS Dynamic Positioning
Deadline: August 19th
Product Focus: Multibeam & Side Scan Sonars

October
Editorial: Offshore Communications, Environmental Assessment & Monitoring, OTEC
Distribution: LAGCOE • MAST Americas • Clean Gulf • Offshore Communications
Deadline: September 16th
Product Focus: Acoustic Modems, Releases & Transponders

November/December
Editorial: Ocean Mapping & Survey, Commercial Diving, Decommissioning, Plug & Abandonment
Distribution: International Workboat • Subsea Survey/IRM • Underwater Intervention
Deadline: October 28th
Product Focus: Workboats & Special Purpose Subsea Vehicles

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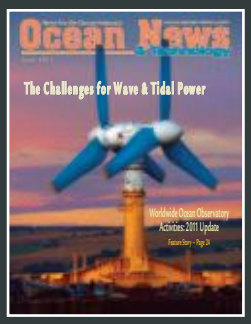

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People & Company News

West Indian Ocean Cable Co., the largest investor in the East African Submarine System (EASSy), appointed **Ryan Sher** chief operations officer. Formerly chief technical officer at West Indian, Sher's expanded role reflects the success the organization has enjoyed since July 2010, when the 4.72 Tbps, 10,000km, EASSy submarine fiber optic cable went live. Capacity sales on EASSy have outstripped initial forecasts and Sher will oversee the 2011 system upgrade, which will utilize the latest 40Gbps wavelength technology. Sher reports to Chief Executive Officer Chris Wood. As COO, Sher is responsible for developing and managing all West Indian product offerings, as well as pre-sales support and bid management, strategic deals, operations, provisioning, OSS/BSS, IT, procurement and supplier management. Prior to joining West Indian in 2009, Sher held senior roles with Reliance Globalcom, previously FLAG Telecom.

Schilling Robotics, LLC announced the official opening of their new North Sea Service and Support Centre in Aberdeen, Scotland. The support centre includes a parts warehouse with over $3 million of ROV and manipulator inventory, comprehensive workshop facilities, and professional training facilities. Additional yard space of 13,000-sq.ft. will allow accommodation of larger equipment. "We recognize that supporting our customers efficiently and effectively is paramount to their operations. At Schilling Robotics, we have implemented a world-class support function that is second to none."

Geometrics of San Jose, California announced the following personnel changes effective 1 April 2011. **Rob Huggins** has retired after 30 years of service. Hugins will continue to assist Geometrics in a part-time strategic planning consulting role. **Ross Johnson** has been promoted to Vice President of Magnetometer Division, a similar title to his previous position, but with expanded responsibilities for the overall direction of the Magnetometer Product Line including the launch of the new high performance G-824. **Craig Lippus** has been promoted to Vice President of Seismic Division, handling the growth of the Seismic Product Line into new areas, including land systems as well as the newest Solid Streamer and P-Cable systems. **Doug Groom** has been promoted to Director of GeoElectrical Products, with overall responsibility for GeoElectrical products as it introduces new designs into that marketplace.

In a bid to further strengthen its sales force BMT Group Ltd,a leading international maritime design, engineering and risk management consultancy, has announced the appointment of **Louise Ledgard**, who will take up the position of Regional Sales Manager (Europe) providing vital support for all of the subsidiaries that operate within the Energy and Environment sector. In addition, BMT Scientific Marine Services (BMT) is has announced the opening of a new office in Rio de Janeiro, Brazil. Trading as BMT Scientific Marine Services Ltda, BMT will operate in Rio de Janeiro as an extension of its existing offices in California and Houston.

KBR appointed **Roy Oelking**, **Dennis Calton** and **John Rose** within its executive leadership organization. Oelking was appointed group president, KBR hydrocarbons responsible for the company's four hydrocarbon business units: downstream, gas monetization, oil and gas, and technology. Calton was appointed president, KBR Oil & Gas, responsible for the strategic growth of one of KBR's four hydrocarbons business units. In anticipation of his retirement in June 2012, Rose will assume the role of executive vice president, KBR Operations. In his new capacity, Rose will examine how KBR's resource centers can more effectively serve KBR's business units in their pursuit and execution of work. Rose previously served as group president, KBR Hydrocarbons. Rose's tenure with KBR spans more than 40 years.

Global Geophysical Services, Inc. names two new independent directors, **Michael S. Bahorich** and **Joseph P. McCoy**, to its Board of Directors. Mr. Bahorich has 14 years experience as a corporate officer with Apache Corporation and presently serves as its Executive Vice President and Chief Technology Officer. Bahorich currently holds eight geophysical patents with two further patents pending. The Board voted unanimously to add a seat for Bahorich to join the GGS Board. McCoy brings to GGS over twenty years of financial leadership at the executive level in oil and gas exploration and production, and currently serves as a member of the Board of Directors and Chairman of the Audit Committee of Linn Energy, LLC.

Chris Mitchell takes over as western region business leader of global engineering and joint-integrity services specialist Hydratight from **Bob Boychuk**, who in turn becomes nuclear portfolio manager. Mitchell will be based at Hydratight's facility in Houston. He has been a senior figure at Hydratight since 2002, when he joined with an initiative to increase the company's general growth.


Mitchell

The board of directors of Baker Hughes Inc. approved the transition of **Chad C. Deaton**, chairman of the board

and chief executive Officer, to the new role of executive chairman beginning Jan. 1, 2012. At that time **Martin S. Craighead** will assume the position of chief executive officer in addition to his role as president of Baker Hughes. Craighead, 51, has been with the company since 1986 serving as president since 2010 and chief operating officer since 2009, senior vice president from 2009 to 2010, group vice president of drilling and evaluation beginning in 2007, vice president of the company from 2005 until 2009, and in various officer positions with numerous Baker Hughes subsidiaries.

Knowledge Reservoir, a leading global energy consulting company, today announced the appointment of **James Thomas** to the position of Vice-President Global Resourcing. Thomas is a veteran staffing and business development professional with over thirty years in the International Oil and Gas projects and operations sectors. He has extensive experience in recruiting and building project teams, and in international staff management on major oil and gas developments both onshore and offshore. He will be based in London and lead the global technical resourcing team at Knowledge Reservoir, comprising engineering and geosciences recruiting staff.

Tidewater Inc. promoted **Nelson Greer**, **Mark Handin** and **Darren Vorst** to vice presidents of Tidewater companies. Greer joined Tidewater in 1982, after completing 13 years in the British Merchant Marine. In his various management positions with Tidewater, he was based in Angola, Nigeria, Congo and Gabon, prior to his current posting in Singapore. Handin joined Tidewater in 1996. His initial postings with Tidewater were in Singapore, Mexico and Brazil, before being promoted in 2001 to area manager in charge of company operations in Trinidad. Vorst worked for six years at Price Waterhouse in Houston, including his final role as audit manager. He joined Tidewater as treasurer in Jan. 2009, following 14 years in various senior financial positions with offshore drillers Transocean and TODCO.

Hydratight, the global joint integrity and engineering services company, is setting up a major new facility in New Jersey for operations across the US eastern seaboard. The new facility, in Somerset, New Jersey also brings together the operations of Hydratight Biach's facilities in Cranford and Flemington to be the new centre of excellent for nuclear products and service.

OceanWorks International welcomes **Robert Keith** as General Manager. Keith's primary function will be to promote the company's deepwater engineering, fabrication, and operational capabilities. He has worked in the offshore underwater services industry for over thirty years, and has actively participated in manned, atmospheric, and remotely controlled diving operations in more than twenty different countries.

Ferguson Modular Ltd, part of the Ferguson Group, has appointed a new Middle East Business Development Manager. **Bradley Hirst** joins the company after accumulating years of business development experience, primarily in the Middle East and Asia Pacific regions. Based in Dubai, Hirst will focus on promoting Ferguson Modular's full range of accommodation solutions to customers, particularly in the Middle East.


Hirst

Calendar

June 6-9, 2011:
Oceans '11 IEEE
Spain
www.oceans11/ieeesantander.org

June 7-9, 2011
UDT
London ExCel, UK
www.udt-europe.com

June 14-16, 2011:
Seawork International
Southampton, UK
www.seawork.com

June 14-16, 2011:
EnergyOcean 2011
Portland, Maine
www.energyocean.com

June 16-17, 2011:
Offshore Brasil
Rio Centre, Brasil
www.brasiloffshore.com

June 27-29, 2011:
MAST Europe
Marseille, France
www.mastconfex.com

August 19-22, 2011:
AUVSI
Washington, DC
www.auvsi.org

September 6-8, 2011:
Offshore Europe
Aberdeen, Scotland
www.offshore-europe.co.uk

September 19-22, 2011:
Oceans 2011
Kona, Hawaii
www.oceans11mtsieeekona.org

September 20-22, 2011:
Submarine Networks World 2011
Singapore
www.terrapinn.com/subnets

October 4-6, 2011:
OTC Brazil
Rio de Janiero, Brazil
www.octnet.org

October 18-21, 2011:
Ocean Innovation 2011
Iqaluit, Nunavut
www.oceaninnovation.ca

October 25-27, 2011:
LAGCOE
Lafayette, LA
www.lagcoe.com

November 7-8, 2011:
MREC Technical Conference
Cambridge, MA
www.mrec.umassd.edu

November 8-10, 2011:
Offshore Communications
Houston, TX
www.offshorecoms.com

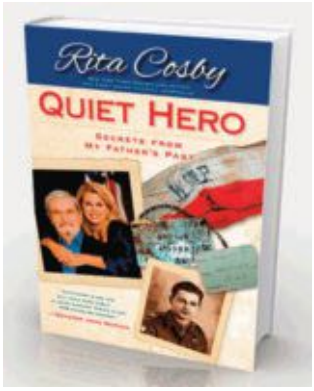
November 14-16, 2011:
MAST Americas
Washington D.C.
www.mastamericas.com

December 13-15, 2011:
Subsea Survey IRM
Houston, TX
www.subseasurvey.com

January 24-26, 2012:
UI 2012
New Orleans, LA
www.underwaterintervention.org

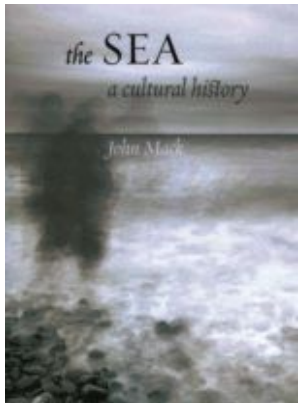
Media Reviews

Quiet Hero



As a renowned journalist for more than two decades, Rita Cosby was one of the first to report that Bin Laden was behind the 9/11 attacks. She also did an exclusive interview with then Pakistani President Pervez Musharraf right after 9/11, where after hesitation, he said he would side with America versus the terrorist mastermind. Cosby also traveled to Afghanistan near Bin Laden's original hide-out in Tora Bora where she spent time with our troops. She was the first journalist to witness an actual interrogation at Guantanamo and see the detainees up close. Now, in her newly released paperback, QUIET HERO: Secrets From My Father's Past, (May 17th, Threshold Editions) she reveals how her own father became a POW who was saved by U.S. troops. Her father's story is one of sheer courage and patriotism as he battled the Nazis in WWII as a teenage resistance fighter, escaping into the sewers and ultimately weighing only 90 pounds (standing six feet tall) when he was rescued. QUIET HERO is also a rare glimpse into the deeply personal story of the effects of war on those who fight and their families. Cosby's father never discussed his visible and invisible scars until now, and as, a result, the journey has caused father and daughter to reunite after decades of estrangement. Cosby has become the national spokesperson for ICAMI's (International Committee Against Mental Illness) stress disorders program and the United Stress Disorders Association, which focus on helping those with PTSD. It's estimated that more than half a million of our troops returning from Iraq and Afghanistan alone will have some form of PTSD, with an estimated 18 veterans a day committing suicide. QUIET HERO has become required reading in psychology and social work courses focused on trauma and recovery in several U.S. universities, including NYU and Fordham. I**SBN-13:9781439165508, Threshold Editions, May 2010, Hardcover, 304 pages, $26.00**

The Sea
a cultural History



"There is nothing more enticing, disenchanting, and enslaving than the life at sea," wrote Joseph Conrad. And, there is certainly nothing more integral to the development of the modern world. In The Sea: A Cultural History, John Mack considers those great expanses that both unite and divide us and the ways in which people interact because of the sea, from navigation to colonization to trade. Much of the world's population lives on or near the coast, and as Mack explains, in a variety of ways, people actually inhabit the sea. The Sea looks at the characteristics of different seas and oceans and investigates how the sea is conceptualized in various cultures. Mack explores the diversity of maritime technologies, especially the practice of navigation and the creation of a society of the sea, which, in many cultures, is all-male, often cosmopolitan, and always hierarchical. He describes the cultures and the social and technical practices characteristic of seafarers as well as their distinctive language and customs. Casting a wide net, The Sea uses histories, maritime archaeology, biography, art history, and literature to provide an innovative and experiential account of the waters that define our worldly existence. **ISBN: 978-1-86189-909-8, Chicago Press, 320 pages, Hardcover, $35.00**

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Website: www.birnsaquamate.com
Contact: Eli Bar-Hai, Operations Director

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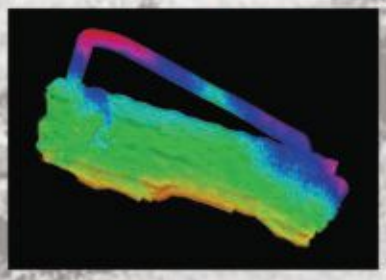
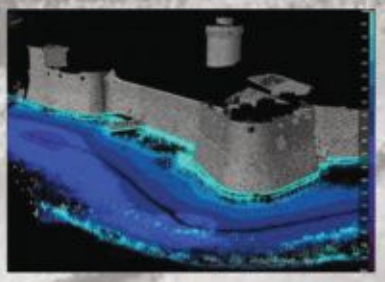
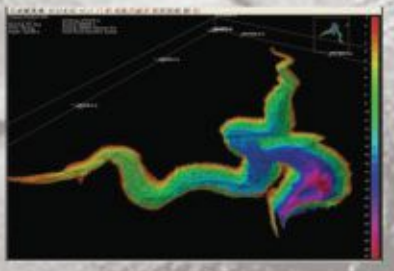
Co-Registered Side Scan and Bathymetry







15 - 20 Times Water Depth

As a leader in the underwater industry since 1984. Shark Marine continues to offer customers state of the art reliable equipment to meet any application.

ROV's

Survey

Video Systems

Defence

Tether Management

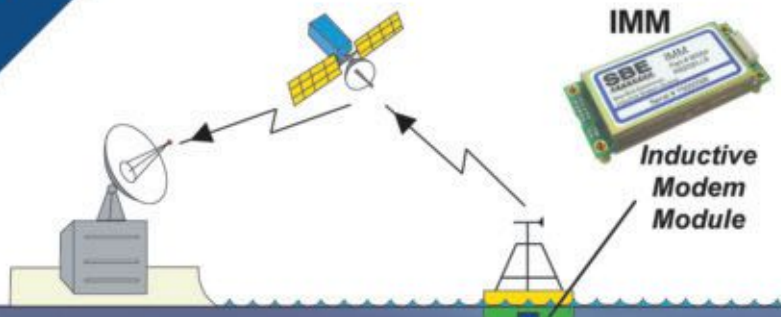
www.sharkmarine.com
sales@sharkmarine.com

Phone 905 687 6672
North America 1 877 99 shark

More than 3,000 Sea-Bird IM instruments deployed worldwide since 1997

Real-Time Data Moorings using *Field-Proven* Sea-Bird Inductive Modem (IM) Telemetry

Using a standard plastic-jacketed, galvanized-steel-wire mooring cable as the communication link, up to 100 instruments are easily positioned at any depth up to 6000 meters without cable connectors



IMM

Inductive Modem Module

SBE 37-IMP-IDO

CT(D)-DO Recorder with Integral Pump

ICC

Inductive Cable Coupler

CTD-DO

CT-DO

CTD

CT

SBE 39-IM

T(D) Recorder

SBE 37-IMP

CT(D) Recorder with Integral Pump

CTD

T

CT

TD

Third party instrument with integrated IMM

Third Party Examples

TRDI DVS with integrated IMM

Nortek Aquadopp IM400

SBE 16*plus*-IM V2

CT(D) Recorder with Auxiliary Sensors (DO, Fluorometer, Turbidity, PAR, etc.)

CT

CTD & Auxiliary Sensors

Underwater Inductive Modem

UIMM

Underwater Inductive Modem Module (make any RS-232 instrument compatible with Sea-Bird IM telemetry)

ADCP or other serial instrument

Maximum 6000 meters

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