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July 2011

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Forum Energy Technologies
Meeting Industry Subsea Challenges





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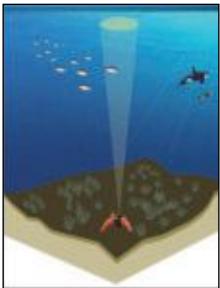


Stable Platform



in this issue

Ocean Industry



Offshore Industry



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CSA International, Inc. deploys deepwater Triton® ROV with advanced scientific suite
Photo courtesy of:
CSA International, Inc.

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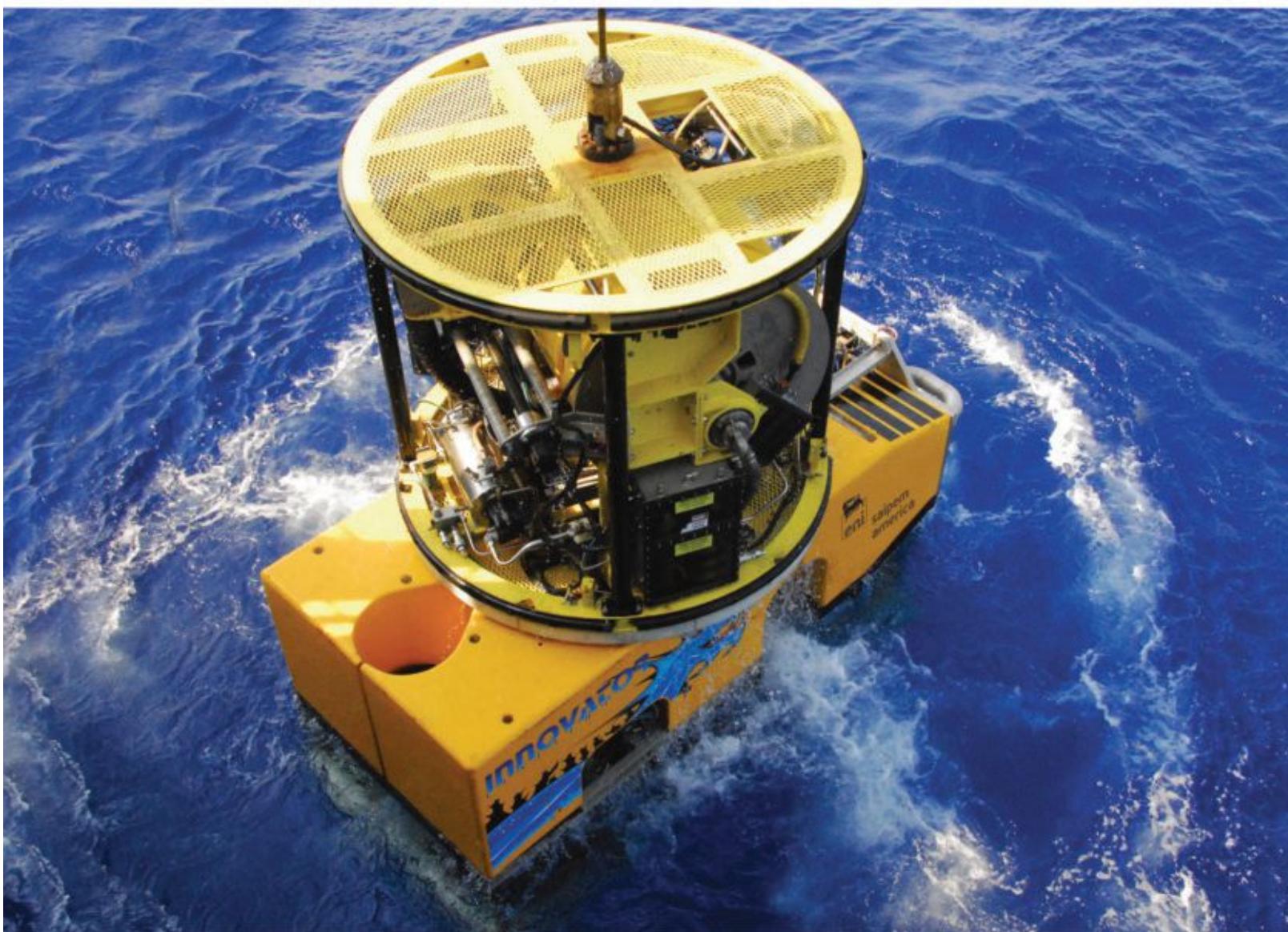
- Buoys & Monitoring Instrumentation



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Editorial

By John Manock



Ocean News & Technology

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In-field cabling: The next wave

I recently attended an event at the University of Rhode Island School of Oceanography celebrating its 50th anniversary. A major focus of the event was how telecommunications technology has enabled the decade-old dreams of visionaries such as Dr. Robert Ballard, a member of the school's faculty, to become reality, thus changing the way scientific studies of the ocean are conducted.

As a long-time participant of the submarine fiber optic cable industry, I have seen the impact that telecommunications technology, in general, and submarine cables, in particular, have had on many industries and markets; making possible or even commonplace the long-held dreams of many people and changing forever how we conduct business, educate our children, and even interact with one another.

While it is interesting to sometimes reflect on how technological changes impact our society in the broadest sense, I always have to bring myself back to reality to focus on the industries that I am directly involved in. When I do, I see the same pattern, fundamental changes beginning to take place in markets that in the past have always operated in one seemingly unchanging way.

I see this when I look at one of my personal interests – subsea fiber networks for the oil and gas industry. The dream of unleashing the potential of fiber optic technology by interconnecting offshore oil and gas platforms on a large scale has been around for awhile, but has never become mainstream. Perhaps it never will, but recent developments seem to be pointing to greater use of fiber for offshore applications than ever before.

Subsea fiber networks for offshore platforms are hardly news. Large networks began to be built in the North Sea in the late 1990s and now more than 2,000 kilometers of cable connect dozens of platforms. Nearly five years ago, construction began on a 1,400 kilometer subsea fiber network in the Gulf of Mexico.

While these networks seemed to set the tone for future large-scale deployment of networks connecting offshore oil and gas platforms, they did not lead immediately to widespread deployment.

The high costs involved in building subsea fiber networks, technological challenges, and reliance on satellite technology have all contributed to slow the large-scale deployment of fiber in offshore applications.

We may finally be seeing a change in this model, however, and it is broadband technology that is driving it, as it has driven so many new developments in recent years. As the Internet continues to revolutionize the way we work and conduct business, the data demands for offshore platforms are growing to the point where the added expense of subsea fiber can be justified by the greater bandwidth fiber provides.

As a result, we are now seeing inklings of new types of subsea fiber networks. These are not just fiber optic connections to platforms, but grid networks encompassing entire fields and connecting to the shore at multiple locations. These networks can be large in the 2,000-4,000 kilometer range. They offer greater reliability and tremendous amounts of bandwidth. As they use the latest submarine fiber optic components, they can be easily upgraded in the future using 40G/100G technology, thus "future-proofing" the networks and bandwidth demands increase.

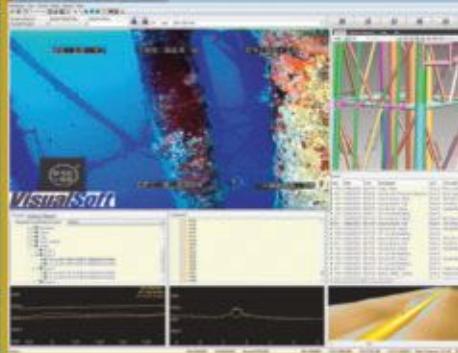
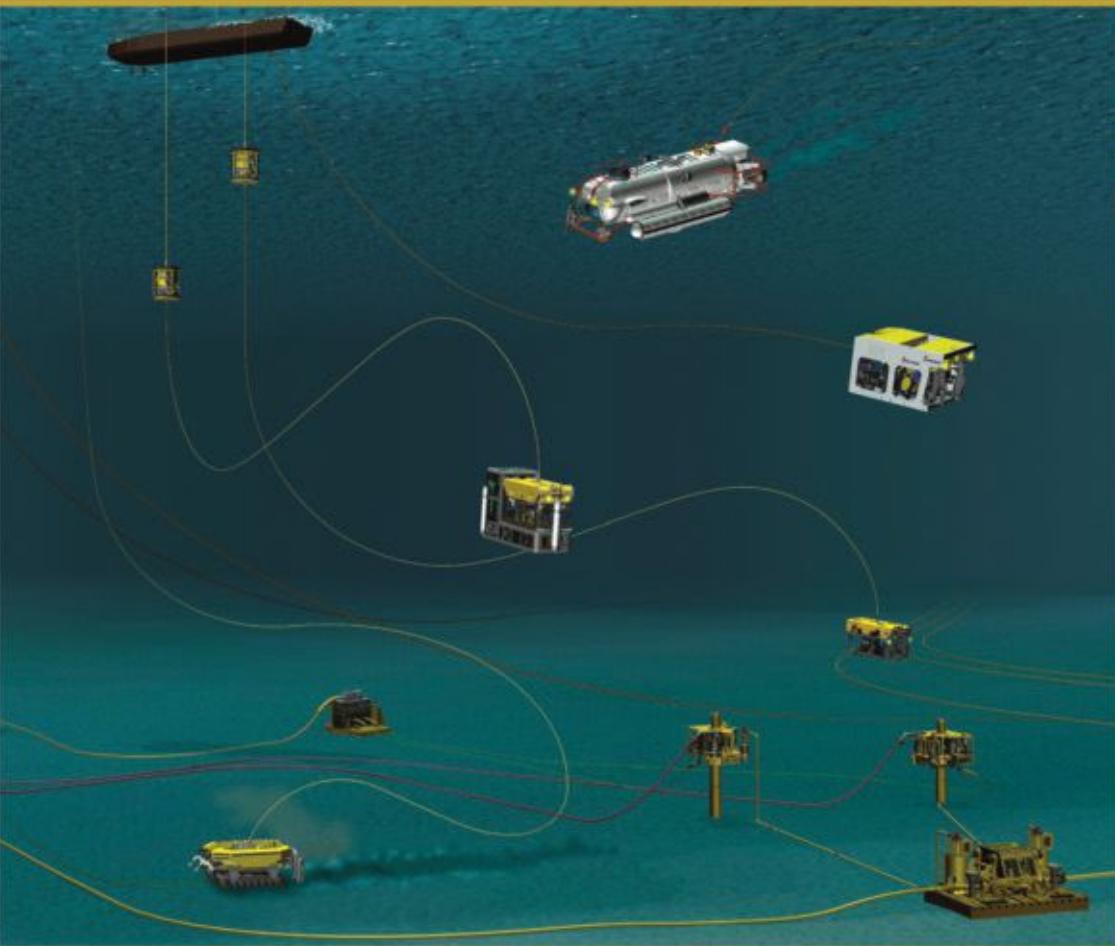
None of these projects have been announced publicly as of yet, but in-field fiber networks represent a future wave of development in the offshore oil & gas industry. They will not be appropriate for every offshore situation, and there will always be a place for satellite communications on platforms, but in-field networks will begin to fulfill the promise of the fully digital offshore oil and gas field.

For the submarine fiber optic cable industry, this is a development that needs to be watched. Subsea fiber networks for the oil and gas industry have been, at best, a niche market. Large networks like those in the North Sea and Gulf of Mexico make nice contracts for systems suppliers, but these have been few and far between.

If in-field fiber networks fulfill their promise, however, large-scale supply contracts could be more numerous. Two or three supply contracts in the 2,000 to 4,000 kilometer range in the course of a year would make a huge impact on overall demand for submarine fiber optic cable, easily accounting for 10% of annual production capacity. This would move the subsea fiber market for the oil and gas industry from a niche to a force to be reckoned with.

Subsea fiber networks may finally be on the verge of entering a consistent growth period. New technologies may once again be on the verge of fulfilling what was once only a dream.

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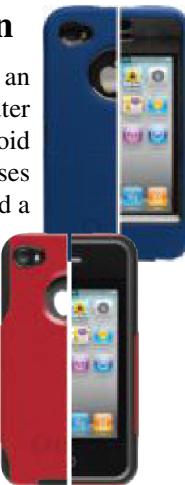
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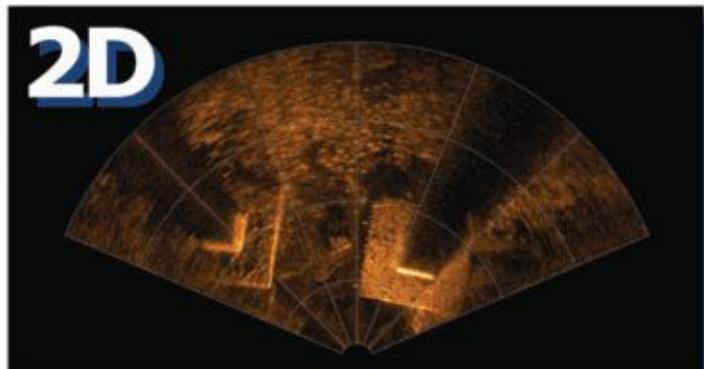
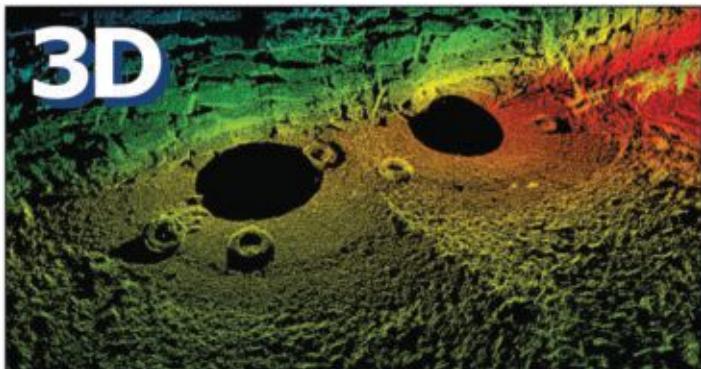
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Forum Energy Technologies: Meeting Industry Subsea Challenges

By Kevin Taylor, Vice President Subsea Vehicles, Drilling & Subsea Division, Forum Energy Technologies

Recent economic and market pressures resulted in consolidations throughout the subsea industry. Those same pressures, however, created a significant opportunity for a new, fresh, strong supplier of product technology to the energy industry: Forum Energy Technologies (FET).

FET was formed in August 2010 with the merger of five companies: Forum Oilfield Technologies, Triton Group, Global Flow Technologies, Allied Technology, and Offshore Joint Services.

Today, with 2,200 employees around the globe, we are a worldwide provider of mission-critical products and services to the global energy industry. These products and services are used by our customers in the subsea, drilling and intervention, completion, production, and processing segments of the oil and gas industry.

Comprising the Subsea Vehicles business unit in FET's Drilling & Subsea Division, Perry Slingsby Systems (PSS) and Sub-Atlantic offer cutting-edge subsea technologies and related



Figure 1 Current range of FET ROV vehicles

services to oil and gas companies and other underwater industries. This is done from our manufacturing and support centers in the UK, the US, and Singapore.

Initiatives such as regional expansion and new product research and development are moving forward. As part of our growth strategy, we will continue to focus on providing clients the latest and most robust technology as well as strong local support.

The combined companies that make up FET form a strong technology base, providing an opportunity to develop broader and more diversified product lines and solve customer and industry problems. Feedback from our extensive customer base from around the world provides invaluable information that we use to enhance our existing ROV capabilities and functionality. At the same time, customer feedback provides insight into new ROV innovations we are developing for the future, such as the imaginative Tomahawk with a large power-to-weight ratio, small size, and a multitude of survey sensor interfaces.

FET Subsea Vehicles

Perry and Sub-Atlantic have a complete range of subsea vehicles (**Figure 1**) and other products that satisfy a large number of customer and industry needs. As those needs expand, so will the range of subsea vehicles and products.

New Products

Based on customer requirements and feedback, FET is increasing the horsepower of its compact, heavy-duty TXLR to 150 and is currently quoting 250 HP TXLX work class vehicles. New products under development include the high power-to-weight-ratio Tomahawk ROV and the XT1200 flow line and cable burial system.

Tomahawk

One of the driving forces in the survey market is ever smaller ROVs with ever increasing and complex sensor interfaces. The trend for better speed through the water while maintaining good stability (and therefore more reliable sensor data) has led to the latest innovative subsea ROV from FET, the Tomahawk (**Figure 2**).



Figure 2 Tomahawk with Top Hat TMS

Market forces plus extensive customer involvement led to an inventive Tomahawk design that can be deployed with a top hat tether management system (TMS). Since the limits imposed by a garage-type TMS are removed, the top hat arrangement allows a broad assortment of survey sensors to be attached. To be delivered in late 2011, the Tomahawk has small size, multiple built-in survey sensor interfaces, and plentiful space for user-specific equipment. With its high power-to-weight ratio and size, Tomahawk is suitable for operation in strong ocean currents, especially those associated with offshore wind farms and inshore tidal generators.

Trenchers

Perry has designed and produced a full line of trenching and cable maintenance vehicles, ranging from the versatile Triton® T200 telecom cable trencher to the powerful Triton® T750 oil field pipeline trencher. These best-in-class vehicles have buried much of the existing subsea cable and pipeline that exists around the world today.

Geotechnical engineering is the technology that drives the design of these systems. It is also the inspiration for many of the innovations and advances that FET has introduced in this field. Examples are the “Steady-Jet” high shear strength jet pipeline trenching system and the “Jet-Assist” high-productivity plow share.

An ambitious research and development program in geotechnical engineering is well established at Forum. This program continuously challenges, updates, and tests new devices for a range of seabed-engaging technologies.

We are currently building for delivery in April 2012 the high power XT1200 flow line and cable burial system (**Figure 3**), capable of burying products up to 36 inches in diameter and of trenching to three meters. Building on the success of the market leading T750, delivered in 2003, the XT1200 incorporates the unique ring frame structure and “steady jet” vertical tool deployment. These features give unrivalled access for maintenance that halves maintenance time and allows efficient water jet trenching, producing unsurpassed product burial speeds.

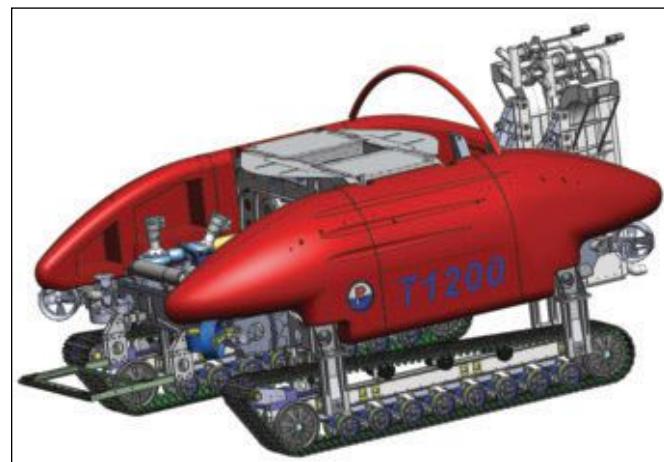


Figure 3 XT1200 Flow Line and Cable Burial System

New Test Facility in Kirkbymoorside UK

The new \$2 million testing and R&D facility (**Figure 4**) is crucial for new product development and for testing new designs. A large portion of the structure is dedicated to vehicle integration and testing along with customer support services and training. Also housed in the building is a large test pool as well as a hyper-

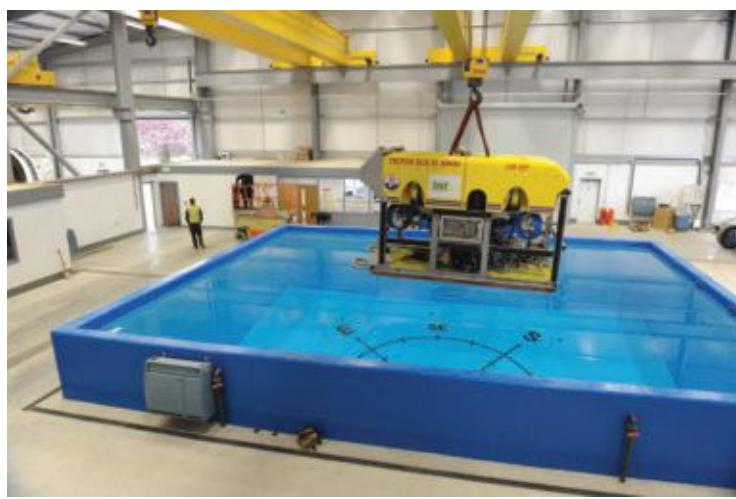


Figure 4 New Testing and R&D Facility

baric test facility, including an expanded research and development capability.

FET Subsea Products

Forum has an extensive range of products and tooling that satisfy industry needs, including ROV intervention tooling (with a significant R&D budget), custom/special subsea products, ICE control system variations, thrusters, “intelligent” manifolds, HPU assemblies, and an evolved problem-solving product, Rovdrill™ 3 (RD3) (**Figure 5**).



Figure 5 Rovdrill™ 3, Legs Version. Also available is a soft-soils Caisson Version

RD3 is remotely operated from the surface and powered by an ROV of opportunity. RD3 is deployed to the seabed in depths to 3,000 meters to take core samples using conventional drilling techniques. Rovdrill technology has proven to save significant costs over drill ship day rates. The system is currently operating at 1,600 meters in the Bismarck Sea, Papua New Guinea.

Research & Development

With a long history of cutting edge ROV design, it is very important for Forum to build on this reputation and success while pushing the boundaries of what an ROV is capable of in the underwater environment.

Current developments include improved dynamic vehicle performance under manual control; auto piloting (AP) facility throughout the water column, offering high positioning accuracy anywhere subsea; capability for remotely accessing and diagnosing an offshore TXLX system from a single land-based PC; remotely controlling an offshore TXLX from a land-based TXLX console; and remotely flying an ROV located in the UK, for example, from a control console located in the U.S., which greatly enhances remote assistance to the operations crew.

Market Forces, R&D, Customer Involvement Lead to Tomahawk
Control System: Intuitive GUI, Intelligent diagnostics, over-current/voltage protection

Single Pod: Increased payload & space for user-specific equipment, allows wide range of survey equipment to be connected

Aluminum Core Frame: Simple to add top hat, no tie bars to take up space, increases possible under-hung or rear-mount skid units

Sensors: Single-mode, fiber optic mux with diagnostics allow wide range of survey sensors via RS232, RS485, Ethernet, HD & 3DHD video, etc.

The Future

Customer feedback, market research, and R&D efforts are leading us into a number of initiatives:

- Full auto-piloting using VMAX 3D real-time navigation suite integrated with vehicle control systems
- Integration of 3D sonars with VMAX 3D Real-Time Navigation Suite (resulting in accurate real-world surveying, positional awareness, and auto piloting for greater situational awareness while also maximizing operational efficiency and reducing mission time and risk)
- Innovative tetherless light intervention vehicles operated under full real-time pilot control.

We continue to build work class ROVs from our facility in Kirkbymoorside UK. With feedback from our extensive customer base from all around the world, we are provided with invaluable information we use to enhance our existing electric and hydraulic ROV capabilities and functionality, including insight into which new ROVs we should be designing for the future.

Forum Energy Technologies has established a unified global presence to support our ROVs and products around the world. Forum is using its broad product range, R&D efforts, and innovative technologies to meet industry and customer requirements, and we are solving customer problems and incorporating customer feedback to help shape our designs going forward.

Offshore operations are complex and the stakes are high, so customers demand high-performance products supported by reliable technology. This offers Forum the chance to leverage decades of real experience into products customers can count on delivered by a company with staying power.

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OCEAN INDUSTRY

Seamount named after Caris employee

Having a seamount named after you is a rare distinction, and CARIS employee Dan Donnell has received this honor.

The Donnell Seamount is located at 50°05.1338'N and 45°21.5796'W and has a summit depth of 1,893 meters.

Dan Donnell receives this honor following 40 years of U.S. government service with the Naval Oceanographic Office and the National Geospatial-Intelligence Agency (NGA). At the NGA, Donnell was the key person in developing the workflow within the bathymetry division and was considered the agency expert on most bathymetric data handling.

Dan Donnell joined CARIS, the world's leading marine GIS organization, in February 2010 and now works on a team with SAIC (Science Applications International Corporation) managing the Seafloor Earth Reference System and GNS II.

Underwater robot competition shines spotlight on oil spill response

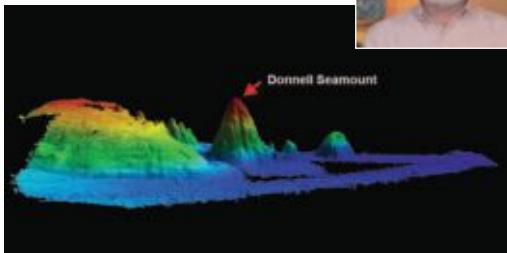
Students competed with ROVs that they designed and built to withstand the same conditions and challenges faced by ROV operators during last year's Deepwater Horizon oil spill. During the Gulf Oil spill, commercial ROVs and their operators worked around the clock for nearly three months to support the operations to cap and contain the devastating spill. Students faced a simulation of this scenario, completing mission tasks such as removing a damaged riser pipe, capping a wellhead, collecting a water sample, measuring depth, and sampling organisms.

This year's contest encouraged students to think like entrepreneurs while creating and testing their ROV. Instead of forming teams, students formed "companies" tasked with designing specialized tools to help with oil spill mitigation. Besides helping students learn critical science, technology, education, and math (STEM) skills, the competition helps them learn about team building, creative thinking, and problem solving, allowing them to compete in today's global workplace.

In addition to the pool missions, the teams were required to submit and present an engineering report and prepare a poster presentation for volunteer judges that are professional technologists and engineers in marine-related industries.

Organized by MATE and the Marine Technology Society's (MTS) ROV Committee, the ROV competition presents middle school, high school, community college, and university students with the same types of challenges faced by scientists and engineers when working underwater. The competition is supported by the National Science Foundation, NASA, NOAA, the Marine Technology Society ROV Committee, and other ocean- and space-related business and organizations.

First held in 2002, the MATE ROV competition program has grown to include 20 regional contests that feed into the international event. ROVs help students become aware of marine technology careers in which they can apply these skills, a critical step in addressing the shortage of qualified engineers and technical professionals. The competition also featured the Ocean Career Expo, which provides a forum for students to speak with representatives of sponsoring organizations to learn more about career opportunities.



An image of the Donnell Seamount as processed using CARIS HIPS and SIPS. The USCGC Healy discovered the seamount in 2000

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USCG reports boating stats

The U.S. Coast Guard announced its official 2010 recreational boating statistics and noted that total fatalities fell to a record low of 672. The 2010 record is four fatalities less than the previous low in 2004, and is 26 deaths lower than the average number for the past 10 years. While the drop in fatalities is a positive sign, the Coast Guard cautions that the number still represents nearly two deaths per day and remains resolute in its commitment to preventing boating fatalities.

Global head of Greenpeace faces jail

The International Executive Director of Greenpeace, Kumi Naidoo, has entered an exclusion zone to scale a controversial Arctic oil rig 120km off the coast of Greenland. He is now demanding that the rig's master orders an immediate halt to drilling and is requesting a copy of the rig's missing oil spill response plan. The document has been at the center of a month-long campaign of direct action in the Arctic. An inflatable speedboat carrying Naidoo was launched from the Greenpeace ship Esperanza. It evaded a Danish navy warship that has been circling the rig for several weeks then he climbed a 30 meter ladder up the outside of one of the platform's giant legs. His action comes after the operators of the oil platform, Cairn Energy, obtained an injunction against Greenpeace from a Dutch court, imposing fines of 50,000 Euros a day for any breach of the exclusion zone. Cairn sought the injunction after 20 Greenpeace activists had been arrested on the rig for stopping the rig operating. As the head of the global organization, Naidoo himself volunteered to scale the rig and personally deliver a new appeal to the rig for an end to dangerous Arctic oil drilling.

DIVEX wins Oceaneering contract

Divex have been selected as the main build sub-contractor for the supply of a Deck Transfer Lock (DTL) unit by Oceaneering International, Inc (OII). The DTL forms part of an overall equipment spread for the Submarine Rescue and Diving Recompression System (SRDRS). OII are managing on behalf of the US Navy. The SRDRS is to be used by the US Navy in the event a Disabled Submarine (DISSUB) ensuring that they are able to provide rapid deployment of this worldwide capable system.

continued next page

The top winners in each class were:



Explorer (advanced level)

1st place: Jesuit High School of Carmichael, California

2nd place: Purdue University of West Lafayette, Indiana

3rd place: Linn-Benton Community College of Albany, Oregon

Ranger class (intermediate level)

1st place: Aptos High School of Aptos, California

2nd place: Ozaukee High School of Fredonia, Wisconsin

3rd place: Carrollton High School of Carrollton, Georgia

For more information about MATE, please visit www.marinetech.org. For more information about MATE's ROV competition, visit www.materover.org.

The Marine Technology Society's ROV Committee announces the winners of its 2011 Annual Scholarships

Trevor Uptain, Adam Simko, Michael Filimon, and Zachary Miller have been selected as recipients of the Marine Technology Society's 2011 ROV Committee Scholarships. In addition Russell Ives, Houston Fortney, Kip Hacking, and Sebastian Baca received MTS ROV Committee MATE Center Scholarships.

All will be recognized during the Awards Presentations at Underwater Intervention 2012 in New Orleans.

SMD receives awards continues expansion

It has been quite year of prestigious awards for SMD; first receiving the 'Subsea UK Company of the Year 2011' and then the "Queen's Award for Innovation". Andrew Hodgson, chief executive of SMD, said: "This award is testament to the creative skills and technical expertise of our engineers in our Research & Development and Production units supported by an outstanding team of



people who continue to excel in their work for the company."

SMD continues to see strong growth in its work class ROV and subsea trenching business streams. This has been underpinned by two additional design and manufacturing facilities, almost doubling the company's workforce in the past 18 months and 3 regional offices in Houston, Singapore and Macae. Each of these offices will provide in-country customer service, support and training.

To further reinforce the regional focus and efforts to provide best in class support to customer's operations, in addition to the main UK spares holding each of the regional offices has a significant local spares inventory. SMD's philosophy of enabling customers to customize vehicles to their own preferences extends to procuring spare parts.

For more information, visit www.smd-us.com.

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- Suited both for long-term and short-term projects

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Typical Projects Served by the OCB

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Wärtsilä to supply power and propulsion for new diving support & construction vessel

Wärtsilä, the marine industry's leading systems integrator, has been awarded the contract to supply an integrated solution for power generation, power distribution, and propulsion for a new diving support & construction vessel (DSCV) currently under construction in Singapore. The order has been placed by Keppel Singmarine, the Singapore-based builder of the vessel. The contract includes the vessel's main power generation system, the Wärtsilä Low Loss Concept full electric and automation system, and a complete integrated propulsion system. The vessel will operate on marine diesel oil (MDO). Wärtsilä will deliver the systems during the beginning of 2012, and the ship is scheduled to be delivered in the second quarter of 2013. The vessel will be owned and operated by the Dutch public company SBM Offshore N.V., the holding company of a group of international, marine technology-orientated companies. Its business is to serve on a global basis the offshore oil and gas industry by supplying engineered products, vessels and systems, and offshore oil and gas production services.

Northrop Grumman wins service maintenance contract for Peter Döhle Ships

Northrop Grumman Corporation's Sperry Marine business unit has been awarded a one-year contract by Peter Döhle Schiffahrts-KG (PDS-KG) and HAMMONIA Reederei (a joint venture between PDS-KG, HCI Capital AG and GE Transportation Finance, Inc.) to provide worldwide service and maintenance for more than 135 ships. Under the contract, Northrop Grumman Sperry Marine will be responsible for all shipboard service, support, and maintenance of the ships' navigation and communication equipment, including repairs, spares management, and required annual inspections and certifications. Sperry Marine will coordinate onboard service from its Hamburg, Germany service center, utilizing the company's international network of over 250 service locations.

ABS announces release of updated habitability guide for workboats

The ABS Guide for Crew Habitability on Workboats will soon re-define the standard for habitability on offshore support and supply vessels. Re-engineered in partnership with prominent service vessel operators and construction yards, the Guide sets criteria for the design of vessels that offer improved working and living conditions for the crew. By applying the habitability criteria in the Guide, operators have the means to help reduce crew fatigue, improve task performance, increase personnel and vessel safety, and assist with the ever-increasing challenges of crew recruiting and retention. Meeting the criteria of this Guide fulfills the accommodations arrangement requirements of the International Labor Organization (ILO) Conventions 92 and 133 and helps demonstrate compliance with the proposed ILO Maritime Labor Convention (MLC), Title 3 Requirements. Requirements stated in the Guide may be applied to vessels falling under the categories of offshore service vessels, tug boats, tow boats, dredges, research vessels, anchor handling vessels, or other vessels providing service to offshore oil and gas exploration and production.

BMT strengthens its vessel capabilities for offshore wind market



BMT Nigel Gee, a subsidiary of the BMT Group, has announced a number of innovative technologies to help improve the experience of personnel traveling to and from offshore windfarms.

It is not only the vessel performance that is affected by rough weather; seasickness amongst workers traveling to offshore sites is a very real business consideration for windfarm operators. In order to further improve vessel performance and enhance the levels of comfort for passengers, especially in rough seas, BMT has introduced an active motion damping system to a number of its designs. This is capable of reducing motions by more than 50% compared to a conventional platform.

BMT has also developed a solution to significantly reduce internal ambient noise levels and eliminate structure borne vibration. This is achieved by incorporating an innovative, resiliently mounted superstructure that does not compromise the design or performance of the vessel and is fully isolated from the hull.

Several of these technologies are currently being incorporated into the new 19m vessel under construction for Turbine Transfers, the design of which fully complies with the new DNV Wind Farm Service 1 class notation introduced earlier this year.

Through its partnership with Turbine Transfers, BMT is also developing a new Active Fender System (AFS) for use on Windfarm Support Vessels. The unique design requires no hydraulics or electrical power and ensures that, in the event of a heavy docking with the turbine foundation, the loads imparted on both the vessel and the turbine structure are minimized. Potential damage to either can have a significant impact on the future operability of the windfarm.

Ed Dudson, Technical Director at BMT Nigel Gee, comments: "Technicians who need to carry out vital maintenance on offshore wind turbines have to contend with extended transit times to and from the shore; therefore, high levels of comfort and safety is paramount."

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

Additional vessels arrive at Sheringham Shoal offshore wind farm

The state of the art crane vessel, the Oleg Strashnov, arrived back at the Sheringham Shoal site early last week after a trip to Vlissingen in Holland to pick up further monopiles, and has resumed foundation installations. Currently there are 162 persons on board, although this number will fluctuate according to activity.

A new vessel operated by Visser and Smit, the Smit Constructor, also arrived on site last week. The Constructor is carrying out secondary work in support of the wind farm construction, installing X-Beams, Bellmouths, J-tubes, and PE pipes, which provide the infrastructure required for the connections between the turbines and the substations for the transfer of electricity generated. The Constructor is also equipped for the necessary diving work involved in these operations. Currently, there are 61 persons on board, although again this will fluctuate according to activity.

This week, the commissioning work on the two offshore substations will begin, and there will be around 20 commissioning engineers on each substation during the hook up and commissioning phase (the maximum number possible per substation is 24 people).

To accommodate the commissioning team during this phase a floating hotel, or Flotel, called the Wind Ambition will shortly be arriving. Measuring 162m long and 28m wide, with a crew of 60 on board, Wind Ambition can accommodate 137 sleeping guests. Formerly named "King of Scandinavia", she served as a ferry on a route between



Harwich/Newcastle and Esbjerg (Denmark) for a number of years. During the remainder of the construction period, the Flotel will accommodate around 80 people at any one time, as the wind farm workers use her as their base during their offshore rotas. Until the arrival of the Wind Ambition, approximately 35 people per day have been transported to and from the wind farm via Wells Outer Harbour to carry out jobs offshore, so the Flotel will provide accommodation right next to the site, minimizing traffic in and out of Wells Harbour.

In support of the above vessels and the construction activity, various personnel transfer boats, including the high-speed craft Vidar and the guard vessel Observer will operate in the field. The larger vessels, such as the Oleg Strashnov, will also be supported by anchor handlers, including the tugs Boulder and Typhoon.

The development of the Sheringham Shoal construction activity will typically involve around 400 people working offshore.




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Advances in ROV Automation

By Matt Whitworth and Steve Cohan, Schilling Robotics, LLC

Introduction

Work class remotely operated vehicles (ROVs) play an increasingly vital and enabling role in today's international deepwater oil and gas exploration and production. Today's deepwater fields can be in water depths in excess of 10,000ft, and the types of equipment being placed on the seafloor are becoming more and more advanced, especially with the advent of subsea boosting and the increasing use of

actions requires experience and hundreds of hours of training.

Today's ROVs incorporate advanced technology, which helps the pilots control the vehicles more precisely and perform tasks more efficiently, than even the vehicles of 10 years ago. The aforementioned increasing demands on ROVs in subsea oil and gas operations will require ROVs to incorporate ever more sophisticated automation.

allow ROV operators to monitor pipelines, platforms, risers, and other structures in mid-water.

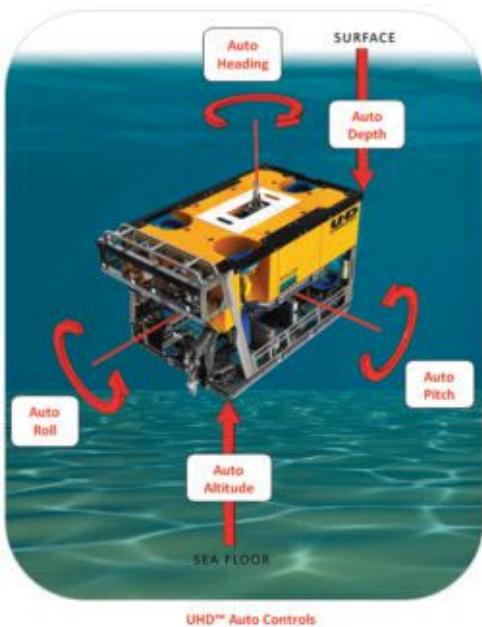
Mid-Water StationKeep™

Over the last two years, Schilling has been developing its Mid-Water StationKeep™ (MWSK™) capability to enhance the operational capabilities of the company's ROVs, the 200hp UltraHeavy-Duty™ (UHD™) ROV and the 150hp Heavy-Duty™ (HD™) ROV.

During March 2011, the company successfully demonstrated the world's first successful application of Mid-Water StationKeep in the Gulf of Mexico, in cooperation with C-Innovation and CDL, following an extensive period of Factory Acceptance Tests.

As described earlier, traditional ROV dynamic positioning functions rely on a DVL system on the ROV that operates within 30m of the seafloor and can only provide relative position. USBL positioning systems provide absolute position, but are unable to support MWSK functionality due to inaccuracy (especially in deep water) and slow update rates, while Inertial Navigation Systems (INS) suffer from drift when unaided.

The solution devised centers around fusing these readily available positioning technologies (INS, USBL, and DVL) and the integration of those technologies with Schilling's next generation closed-loop control system. At the heart of the solution is CDL's MiniPOS3 INS platform, which produces a highly stable INS solution that is aided by either USBL or DVL depending on sensor data availability and quality. The combination of MiniPOS3 functionality and Schilling ROV software automati-



subsea processing. This means that ROVs, and the pilots that operate them, are continuously being called upon to carry out increasingly demanding tasks.

Never was this more evident than during last year's Macondo disaster when up to 16 ROVs were working simultaneously in the attempt to stop the flow of oil. Anyone who witnessed the video footage streaming from these 16 vehicles would have recognized that controlling these vehicles from two miles away is a highly skilled operation. As a result of Macondo, government regulation on subsea operations is increasing the requirements of testing the BOPs during drilling operations. At the same time, there is increasing attention on the maintenance and inspection of these advanced subsea infrastructures. This means that piloting today's ROVs successfully in these types of critical oper-

ROV Automated Control

During the last 10 years, it has become common to find automated control systems on ROVs, providing the ability for these vehicles to be dynamically positioned relative to a subsea structure. This allows the pilot the ability to position the vehicle close to the work site and activate the auto mode, allowing him to operate manipulators or simply to observe while being hands-free. Schilling Robotics, based in Davis, California, was an early pioneer of this technology around 2001, when the company's StationKeep™ capability was introduced on their ROVs. Since that time, the accuracy of StationKeep™ has improved considerably and is unmatched in the industry, with the ability to hold a watch circle with an accuracy of less than 10cm. This is achieved through the use of a Doppler Velocity Log (DVL) and a Motion Reference Unit (MRU), the data from which, when coupled with feedback from thruster sensors, is fed into Schilling's closed-loop control system to give precise control of the ROV.

The common use of these auto-functions has revolutionized the effectiveness of today's ROVs and the pilots that operate them. However, there are limitations when using a DVL to provide dynamic positioning capability. The DVL requires the vehicle to be within 35m of the seafloor since it uses the seafloor as a reference to provide its position data. Outside of the DVL operational envelope, dynamic positioning is unavailable. Also, environmental conditions can affect DVL output, which can cause the dynamic positioning function to disengage and interrupt position control.

One of the industry's desires for many years has been the development of technology that would allow the vehicle to hold position anywhere in the water column. This type of capability would

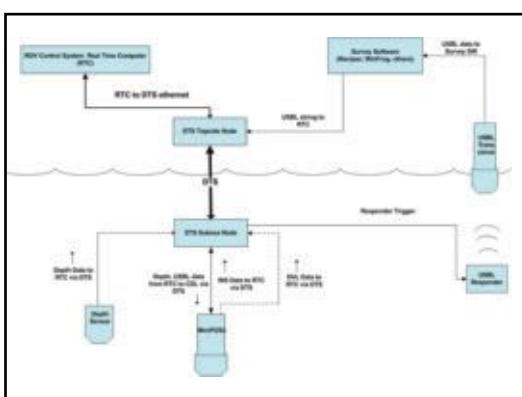


Figure 2 - Architecture and data flow

ROV Automation

cally provides the pilot with ROV position information based on the best combination of sensors available.

The architecture and data flow of the complete system is shown in **Figure 2**.

During the sea trials carried out in March 2011 aboard the Chouest Holiday, a C-Innovation-owned UHD™ performed an extensive set of test procedures. This demonstrated the world's first commercial work-class ROV MWSK system utilizing inertial technology aided by a surface based USBL positioning system.

The performance of the MiniPOS3 and the Schilling control system can be seen in **Figure 3** and the results are remarkable. The absolute positioning accuracy of the ROV (without DVL) was noted at a standard deviation of less than 40cm during MWSK. With DVL lock this improved dramatically to approximately 3cm.

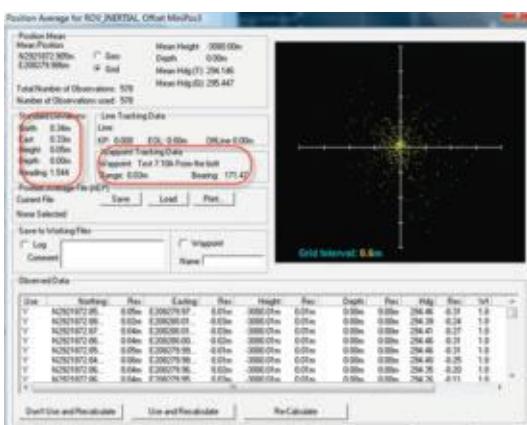


Figure 3 - MWSK trial results

Detailed Results

The trial was very successful with the Mid-Water StationKeep function performing better than expected. MWSK modes, including different sensor aiding states, were tested at a variety of depths.

Data presented below shows five test cases:

- 1) StationKeep with USBL + DVL aiding at 10,000ft
- 2) USBL aiding only at 10,000ft (1)
- 3) USBL aiding only at 10,000ft (2)
- 4) USBL aiding only at 3,000ft
- 5) USBL aiding only at 300ft

These measurements are obtained from MiniPOS3 data, sampled at 10Hz.

In **Figure 4**, the positions of the five test cases shown are aligned at their average positions for ease of comparison. For each case, the data points show the ROVs

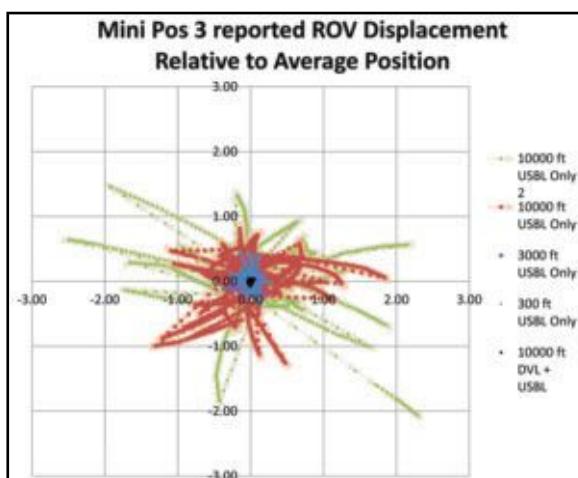


Figure 4 - MWSK displacement results

motion during the test relative to the average position. The arrows between points indicate the relative speed of movement between points. The units are in meters of Northing and Easting. As an example, in the first case of USBL-only aiding at 10,000ft (red data points), the ROV's maximum excursions from its average position was just under 2m in East and just over 1m South.

Figure 5 provides another view of the data. Here, the Y-axis values represent the straight line distance that the ROV moved away from the StationKeep start position

varied from run to run. Generally, the radius was about 1.5m, but could be as large as 3.25m.

MWSK with USBL aiding is appropriate for a set of tasks that is complementary to tasks that are currently performed with the DVL-aided solution. For example, it would be impractical to operate valves on an ROV intervention panel with a 1.5m to 3m watch circle, but a pilot could hold position during transit with no visual reference, or hold position a safe distance from a subsea structure confidently, without having to use visual or sonar feedback.

It is important to note that although USBL is the only aiding sensor supported today, in principle, other sensors could be used to provide this aiding, including video and sonar. Using these could provide more advanced ROV functions, smaller watch circle, and other capabilities.

As a result of these successful trials, Schilling has already made this technology commercially available. The first application will be installed on a C-Innovation owned UHD™ during July 2011.

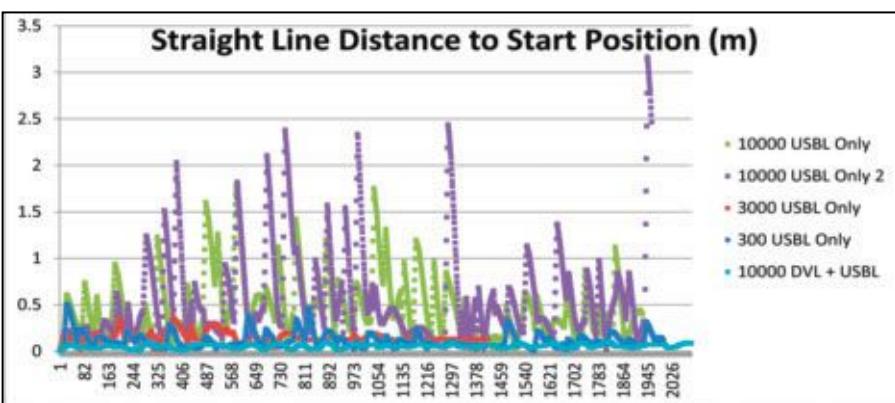


Figure 5 - MWSK straight line distance results

(as opposed to the average position used above) over a 2 to 3 minute period.

As an example, in the second case of USBL only aiding at 10,000ft (purple data points), the ROV moved as far as 3.25m away from its starting position during the test period. We have observed that with USBL aiding only, the ROV was able to keep station within ± 0.5 m at both ~ 300 ft and $\sim 3,000$ ft. We also found that the watch circle at 10,000ft was larger and

Conclusions

ROV auto-functions are now essential to aid the effectiveness of today's advanced ROVs. As oil and gas operations place greater and greater demands on both the vehicles and the pilots that operate them, the level of automation required to operate safely and efficiently will necessarily increase. Schilling's Mid-Water StationKeep technology is the latest in a series of industry pioneering advances that will help ROV operators improve their efficiency, resulting in lower vessel costs.

Forecast predicts biggest Gulf dead zone

Scientists predict this year's "dead zone" of low-oxygen water in the northern Gulf of Mexico will be the largest in history — about the size of Lake Erie — because of more runoff from the flooded Mississippi River valley. Federal and university scientists predict this year's zone will be between 8,500 square miles and about 9,400 square miles. The actual size of the dead zone will be measured over the summer. The largest recorded dead zone was found in 2002 when 8,400 square miles of the Gulf was found to lacking sufficient oxygen for most marine life.

NOAA, coastal states discuss U.S. tsunami capabilities, local preparedness needs

NOAA and its federal partners met on Capitol Hill with East Coast, Gulf, and Caribbean state officials to discuss U.S. tsunami warning capabilities and the need for better local preparedness. NOAA's National Weather Service organized the federal-state conference at the request of Rep. Frank Wolf. "Japan is one of the best disaster-prepared nations in the world, yet they have been severely challenged to respond to and recover from the devastating combination of earthquakes, tsunamis, and radiation leaks," said Jane Lubchenco, Ph.D., under secretary of commerce for oceans and atmosphere and NOAA administrator. "However, Japan's preparedness actually did pay off and may have saved as many as 337,000 lives based on population estimates in affected areas. We can learn from their challenges and successes." The tsunami threat is often overlooked in the Atlantic basin, including the Gulf of Mexico and Caribbean Sea, because catastrophic events in that region have been rare. However, in January 2010, an earthquake off the coast of Haiti generated a 10-foot high tsunami, and nearly 2,000 people were killed in 1946 when a tsunami struck the Dominican Republic. "Make no mistake: the threat of tsunamis along the eastern seaboard, Gulf coast, and Caribbean islands is very real," Lubchenco said. "Vulnerable communities should be prepared." NOAA's two tsunami warning centers provide around-the-clock monitoring and warning of tsunami threats for the United States and many other parts of the world. NOAA recently launched a new Caribbean Tsunami Warning Program, which aims to increase awareness and preparedness throughout the Caribbean.

NAVFAC Awards Environmental Services, Technologies Contract

Specialty Center Acquisitions, Naval Facilities Engineering Command (SCAN) awarded a maximum amount \$75 million contract 9 June, for performance-based Environmental Services and Technologies (ESAT) support for Navy, Marine Corps, and federal government programs at various locations worldwide. The contract was awarded to Battelle Memorial Institute of Columbus, Ohio. This engineering services ordering contract was awarded to satisfy overall operational objectives of U.S. Navy and Marine Corps installations, and other federal organizations.

Honduran president announces shark sanctuary

Photo courtesy of Guy Harvey

Honduran President Porfirio Lobo Sosa announced a permanent shark sanctuary in Honduran waters, building on the country's 2010 shark-fishing moratorium. The designation encompasses all 240,000 square kilometers (92,665 square miles) of the country's exclusive economic zone on its Pacific and Caribbean coasts.

"We have seen that protecting sharks helps our environment and our people," said Honduran Vice President María Antonieta Guillen de Bogran, who also attended the announcement. "When tourists come to Roatan and other destinations, they spend money to see the sharks. But these animals don't just help the Honduran economy. Our coral reefs and marine environment thrive because these apex predators are safe in our waters. Today's declaration will help us all, underwater and on land, for generations to come."

"Honduras has now set a conservation standard that other countries in the Americas should emulate," said Jill Hepp, manager of Global Shark Conservation for the Pew Environment Group. "More and more, world leaders are realizing that, in addition to their value to the ecosystem, sharks are worth more alive — for diving, snorkeling, and watching — than dead."

President Lobo Sosa signed legislation that established the sanctuary at an event hosted by the Pew Environment Group on the Honduran island of Roatan. He also joined other government representatives from Central America to observe shark research off the coast.

"Because of overfishing and the global fin trade, scientists estimate that up to 73 million sharks are killed every year," said Maximiliano Bello, senior adviser to the Pew Environment Group in Latin America. "This action taken by Honduras today, along with the future actions it will inspire, will help immensely in lowering this unsustainable catch."

In September 2010, President Lobo Sosa joined President Johnson Toribiong of the Pacific island nation of Palau at the United Nations to challenge other world leaders to save sharks, stop the practice of finning, and end global overfishing of the species. Palau established its shark sanctuary in 2009.

The Pew Environment Group is the conservation arm of The Pew Charitable Trusts, a non-government organization that works globally to establish pragmatic, science-based policies that protect our oceans, preserve our wildlands, and promote clean energy. www.PewEnvironment.org/Sharks.

Guy Harvey seeds cultural change and prize money to promote catch and release into the structure of shark tournaments

With shark populations around the world continuing to spiral downward, the result of devastating commercial fishing techniques and an exotic taste for “shark-fin soup”, marine scientists such as Dr. Guy Harvey, are working around the clock to give these magnificent animals a fighting chance for survival.

In his latest mission, Dr. Harvey—better known throughout North America and the Caribbean as a celebrated and award-winning marine wildlife artist—has brought his cause into the epicenter of one of the nation’s oldest and largest shark fishing tournaments in Ocean City, Maryland on 15 to 19 June.

Thanks, in part to, Dr. Harvey’s efforts and a willingness to continue to adapt by the tournament founders and organizers, The Ocean City Shark Tournament’s cash and prize package payment in the catch and release division has increased to over \$15,000.

Last month, the Second Annual Guy



Harvey Ultimate Shark Challenge, a catch and release only tournament, was held on the West Coast of Florida in Punta Gorda. The tournament—created as a model for catch and release only shark tournament formats—drew some 3,000 competitors and spectators and paid out over \$15,000 in cash and prizes.

The Ocean City Shark Tournament will continue to feature two divisions that allow anglers to bring sharks to the scales. However, knowing that competitors tend to follow and pursue whatever division has the biggest payout, tournament directors are looking to make the release division cash and prizes so attractive that, by their own choosing, fishermen will voluntarily opt to release more sharks.

“We applaud the tournament founders and directors for their increased commit-

ment to promote the catch and release of sharks in this summer’s tournament,” said Dr. Harvey. “Our goal is to minimize shark mortalities and maximize educational outreach about shark conservation.”

Dr. Harvey, founder of the Guy Harvey Research Institute at Nova Southeastern University and the internationally regarded Guy Harvey Ocean Foundation (GHOF), in recent years has joined the growing ranks of individuals and organizations calling for strict regulations to ban the commercial fishing of all sharks in The Bahamas. Scientists with the International Union for Conservation of Nature have estimated that 30 percent of shark and ray species around the world are threatened or near threatened with extinction. The loss of these animals could cause irreversible damage to the ocean’s ecosystem and result in the loss of hundreds of millions of dollars in the tourist trade.

Dr. Harvey’s message regarding shark protection initiatives is heard loud and clear in the recently released documentary “This is Your Ocean: Sharks,” co-

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staring fellow artist Wyland and photographer Jim Abernathy. The 44-minute documentary, which premiered at the Newport Beach Film Festival to positive reviews, depicts sharks in their environment capturing both adventure and passion and providing the audience with face-to-face realism never shown before on film.

Recent extreme climatic events underscore the need for NOAA Climate Service

The House Committee on Science, Space, and Technology held a hearing titled, "Examining NOAA's Climate Service Proposal." The hearing reviewed the Administration's reorganization proposal to create a climate service line office at the National Oceanic and Atmospheric Administration (NOAA). Testifying before the Committee were Dr. Jane Lubchenco, Administrator, NOAA, and Mr. Robert Winokur, Deputy Oceanographer, Department of the Navy.

NOAA has a comprehensive observation network that gathers ground and satellite-based information from land and sea on weather, climate, atmospheric chemistry, and other environmental data. NOAA manages, archives, and makes this data available to a wide variety of stakeholders. This includes maintenance of the nation's historical climate record. NOAA also has an extensive network of regional and local offices delivering weather and climate information and works in partnership with state climate offices, private sector weather providers, universities, and other organizations with experience in developing and delivering information on weather and climate.

"The Climate Service Line Office at NOAA would be a single point of contact in NOAA to provide credible, useful, and timely information products," described Dr. Lubchenco. "The proposed Climate Service Line Office at NOAA would improve NOAA's organization such that the agency can be a more accessible, transparent, and collaborative partner to achieve the agency's climate goals and to ensure that all Americans' needs for climate information are met."

Mr. Winokur testified about the importance of climate information to the U.S. Navy. He said, "Part of the military mission is to anticipate threats and changes to national security. Climate change and its interaction with and impacts on demographics, technology, globalization, and resource allocation and management will be one of the drivers of security in this century."

New Buoy on the Bering Sea

AXYS Technologies Inc. (AXYS) of Sidney, British Columbia has been awarded a contract from the University of Alaska Fairbanks (UAF) to provide a data buoy for environmental monitoring south of the Bering Strait near Alaska. The contract was awarded in April and includes the supply of a 1.8m diameter WatchMate™ buoy, plus system training, commissioning, and telemetry.

Researchers, led by David Atkinson of University of Victoria, are interested in gathering wind, wave and current data from the buoy to better understand the links between wave, and swell conditions and the weather systems driving them. The WatchMate™ buoy is configured with twin Gill ultrasonic wind sensors to detect icing events, a TRIAXYS™ Directional wave sensor, and air and sea surface temperature sensors. Hourly data from the buoy will be sent to UAF, UVic, NOAA forecasters, U.S. and Canadian Coast Guards, and communities. Data logged on board the buoy will be further analyzed for time series and historical studies.

For more information, visit www.axystechnologies.com.

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BOEMRE to prepare an Environmental Assessment for marine hydrokinetic technology testing offshore Florida
 The Bureau of Ocean Energy Management, Regulation and Enforcement (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). 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 9 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.

24B Euros of fuel costs avoided from wind energy in 2015

Rising fossil fuel prices, devastating oil spills, and the nuclear crisis in Fukushima have substantially raised expectations of wind energy. On the eve of Global Wind Day 15 June, the wind industry revealed the globally avoided fuel costs from wind energy. In 2015, wind power will avoid 23.7 billion Euros of fuel costs — made up of 15.1 billion Euros of avoided coal costs, 6.4 billion Euros of avoided gas costs, and 1.7 billion Euros of avoided oil costs to produce electricity. In 2020, wind power will avoid 87 billion Euros of fuel costs — made up of 46 billion Euros of avoided gas costs, 27 billion Euros of avoided coal costs, almost 10 billion Euros of avoided oil costs and 4 billion Euros of avoided biomass costs to produce electricity. These figures are based on the International Energy Agency's data on fuel costs (IEA World Energy Outlook 2010) and Global Wind Energy Council data (GWEC, 2011; Outlook, 2010) on "moderate" development of wind power with 460 Gigawatt (GW) of global cumulative wind power capacity installed by 2015. The global trend for installed wind power capacity is impressive, from 60 GW in 2005, to 120 GW in 2008 to 200 GW in 2010.

MREC call for abstracts

The New England Marine Renewable Energy Center (MREC) announces its call for abstracts for its third annual technical conference 7 to 8 November 2011 in Cambridge, Massachusetts. The conference has been expanded to two days and will include sessions on tidal energy, wave energy, offshore wind, environmental impact, numerical simulation, and a special session for students: Kids in the Lab. Abstracts of 250 words must be submitted by 15 July to MREC@umassd.edu.

Massachusetts is winding the future

Chicago may be known as the Windy City, but as of 18 May, Boston is home to the largest commercial wind blade test facility in the world. The Wind Technology Testing Center at the Boston Autoport in Boston Harbor is open for business. To produce more power from the wind, manufacturers have been creating longer and longer blades. But until now, all blades longer than 50m had to be shipped to European facilities to be tested. Now that the Wind Technology Testing Center is up and running, companies can test the next generation of wind blade technology—up to 90m long. When selecting Massachusetts for the Wind Technology Testing Center in 2007, the DOE pledged \$2 million for the project. In 2009, the department awarded Massachusetts an additional \$25 million in funding from the 2009 American Recovery and Reinvestment Act. The Massachusetts Renewable Energy Trust, now part of the Massachusetts Clean Energy Center, contributed an additional \$13.2 million in grants and loans.

OTEC environmental model completed

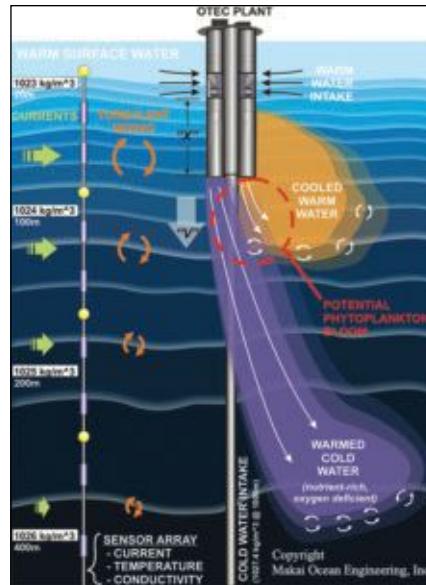


Diagram of an OTEC plant discharge plume; modeling is being done to simulate the biological impact of bringing large quantities of cold, nutrient rich seawater to the surface

Makai Ocean Engineering has successfully completed a numerical hydrodynamic model to simulate the large discharges of Ocean Thermal Energy Conversion (OTEC) plants in the ocean environment. The 3D-hydrodynamic model is based on the EPA-approved Environmental Fluid Dynamics Code and receives realistic oceanographic currents and density data supplied by the Hawaii Regional Ocean Modeling System.

Dynamically coupled, finite-element jetplume models simulate the entrainment and turbulent mixing of large OTEC plumes. This work was funded by the Center for Excellence in Research in Ocean Science (CEROS). Makai is also adapting the model to simulate the increased biochemical productivity that may occur because of the nutrient-rich discharges. This follow-on work is funded by DOE and Makai, with a cost share from Lockheed Martin.

Aquamarine Power prepares for second Oyster installation

Wave energy company Aquamarine Power took the first step towards installation of its second full-scale Oyster wave energy converter 15 June with the arrival of the "Excalibur" jack-up barge in Orkney.

The vessel is now stationed at the European Marine Energy Centre's (EMEC) Billia Croo site, where the Oyster will be installed later this summer. The jack-up barge will now begin drilling piles into the seabed to provide the foundation for the second generation device.

The Oyster device is due to arrive in Orkney late July. The device has been manufactured by Burntisland Fabrications at its Methil and Arnish yards. The fully-fabricated Oyster will be transported from Methil to EMEC by barge in July.

The next phase of installation will see Oyster being fixed to the seabed piles around 500m from shore. This will be followed by a commissioning process which will see the device connected to an onshore hydro-electric generator via subsea pipelines.

Work has been ongoing onshore at Billia Croo since October last year when preparation for the directional drilling of the sub-sea pipelines began. These pipelines were successfully completed in May.

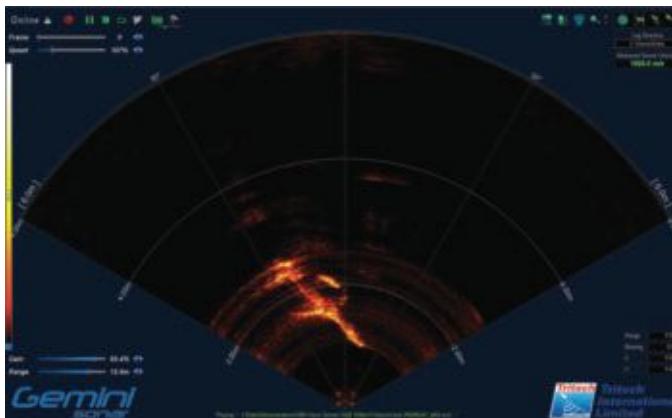
Aquamarine Power installed its first grid-connected Oyster wave energy device at EMEC in Orkney in 2009. The first Oyster operated through two winters and delivered over 6,000 offshore operating hours.

In March 2011, Aquamarine Power removed the first Oyster's buoyant flap and towed it from its berth to a sheltered seabed site at Lyness, around 10 miles southeast of Billia Croo. This operation was successfully completed by Orkney Towage and Leask Marine.

For more information, visit www.aquamarinepower.com.

Tritech launches renewables mammal detection system

Tritech expands its sonar range with a key renewables device, launching its Gemini SeaTec Mammal Detection System.



Gemini SeaTec is a mammal detection system that provides a valuable tool in the detection of marine life around subsea turbines. Tritech's subsea sonars have been deployed on marine current structures since 2008 when the company made its first step into the offshore renewables sector. Tritech has now developed its real-time multibeam imaging sonar technology for this market.

The Gemini SeaTec system uses Tritech's industry standard Gemini 720id multibeam sonar and its bespoke image detection software. This innovative software subsequently provides an early warning of the presence of sea mammals in the vicinity of marine current turbine structures. The Gemini SeaTec provides real-time monitoring of marine wildlife, allowing the operator to take corrective action as required. The logged data can be stored for analysis and used for environmental assessment as part of the current turbine development process.

The Gemini SeaTech is currently installed on SeaGen, a tidal turbine, in Strangford Lough, County Down, Northern Ireland. Tritech has worked closely with the commercial arm of the Sea Mammal Research Unit (SMRU Ltd) at St. Andrews University and tidal energy company Marine Current Turbines (MCT) to help develop the Gemini SeaTec system.

Further applications for Gemini SeaTec include survey of pre/post cable lay survey operations, subsea monitoring and inspection, and scour monitoring.

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

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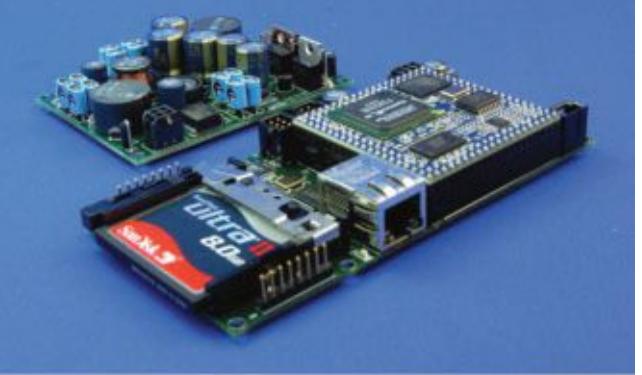
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Flexible synchronization output options

Specs, solid models and SDK are available at <http://www.marinesonic.us/sshds/documents.php>

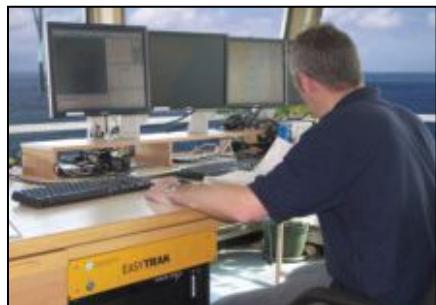
See <http://www.marinesonic.us/ESSHDS.pdf> for more details



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Emu gives Easytrak Nexus top marks for accuracy

The Easytrak Nexus has been successfully deployed on various subsea tracking surveys across the globe since its introduction in 2009 and is currently being used nearer to home during the geophysical survey of sections of North Sea, close to shore.



The Geosurvey Department of Emu Ltd, a marine development, research, and planning company based in Southampton, UK, is using the Applied Acoustics' system on several high resolution windfarm engineering and UXO (unexploded ordnance) surveys off the east coast of England. It is currently on the 12m vessel Emu Surveyor being used to track towed

sensors in less than 5m of water. Two additional Nexus systems are on hire for similar jobs, one on the 24m survey vessel RV Discovery and one on a charted vessel Nabcat II.

Emu has found the Nexus system particularly reliable and accurate in shallow water environments compared to other USBL systems they have used, and has been impressed with the consistency of results.

Easytrak Nexus is a rack-mounted USBL positioning system incorporating digital spread spectrum technology in its design. This reduces the transmitted acoustic signals' susceptibility to interference enabling the calculation of accurate positioning information. The technology also rejects unwanted reflected signals that have made operating in challenging locations such as ports and harbors difficult in the past.

The North Sea survey work currently being undertaken by Emu represents the early stages of significant wind farm expansion plans formulated by the UK Government that is committed to raising the proportion of energy derived from renewable sources from 2.4% to 15% by 2020.

M&A activity in the renewable energy sector is set to increase, with Europe predicted to see the most significant activity

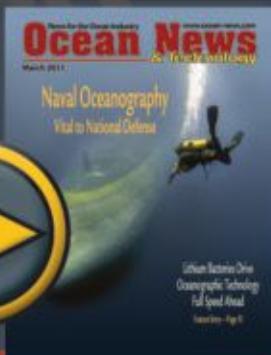
The renewable energy space is expected to see a high level of M&A activity in the next 12 months, according to a new report published by mergermarket in association with Rödl & Partner. In a survey conducted in Q2 2011 of 100 senior M&A practitioners involved in the renewable energy sector, 72% expect an increase in renewable energy M&A activity. This bullish sentiment could be attributed to a number of factors, including the devastating effects of the Fukushima disaster.

67% of respondents expect Europe to be at the forefront of this increase, forecasting that the region will see significant activity. This is attributed by some respondents to Europe's variety of resources, with one respondent noting that "Europe has a great diversity: The Nordics are great for wind power; Italy, Spain, and Greece for solar; and continental Europe for geothermal and biomass." The long-term feed-in tariffs introduced by Germany are also highlighted as an important aid in bolstering renewable energy investment.

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The renewable sector globally has seen 51 deals at a total value of €10.6bn this year to date. Iberdrola's pending 20% stake bid for Iberdrola Renovables SA is the biggest deal of the year at €2.6B, followed by Electricite de France SA's €1.5B bid for EDF Energies Nouvelles SA (50% stake).

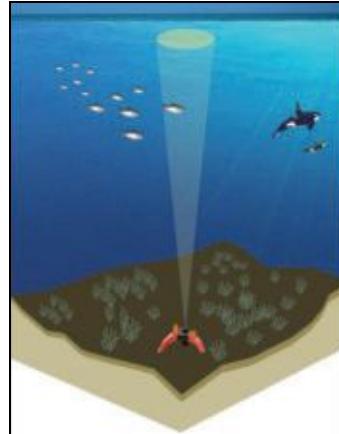
Northwest research team successfully deploys submersible echosounder at renewable energy site

The University of Washington, working with NOAA's Northwest Fisheries Science Center (NWFSC), recently retrieved a BioSonics DT-X SUB split beam echosounder after a 1-month deployment in northern Admiralty Inlet, Washington. The study location is a proposed Snohomish Public Utility District tidal energy demonstration project site. The BioSonics DTX-SUB is an autonomous scientific echosounder packaged in a sub-sea pressure housing with integrated power management and data storage systems.



The DT-X SUB is used to detect, categorize, and enumerate pelagic fish, invertebrate, and marine mammal species at the proposed site. The intent is to allow marine hydrokinetic site and device developers to install tidal turbines in suitable locations while minimizing behavioral effects on aquatic organisms.

After programming the echosounder configuration and duty cycle at the surface, the echosounder was deployed to the sea floor and affixed to a Seaspider tripod instrument mount. The programmable DT-X SUB system automatically collected and logged water column backscatter data from split beam transducers throughout the month-long deployment. The scientific echosounder was programmed to collect data every other hour in a 10% operational duty cycle, alternating between pinging and sleep modes. This duty cycle maximized temporal coverage and extend-



ed battery life for the duration of the deployment. DT-X SUB and other remote sensors affixed to Seaspider tripod. The system was retrieved using acoustic releases, and the data files were downloaded for processing of fish abundance, distribution, and behavior information.

For more information, visit www.biosonicsinc.com.

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Test Tools to Locate Faults in Submarine Cables

By Stephen Colangelo, Anritsu Company

As fixed and mobile broadband growth continues, the demand for capacity between continents increases, especially to support online video content. To meet these requirements, new subsea networks are being built and upgrades are being made to existing connections. Today, the rate for many undersea cables is 10 Gb/s, but higher rates are on the way. Some cables that span continents now have 40 Gb/s rates, while industry R&D labs have demonstrated 100 Gb/s rates and higher.

With the submarine optical cable industry continuing to grow at this steady rate and the increased reliance on transcontinental data traffic, it is critically important to minimize optical network downtime. Increased data rates are one reason, however, user expectation and reliance on connectivity are becoming ever-important considerations. This has caused several of the latest submarine cable cuts to become news within both the industry, but as well as within the wider public arena.

The submarine network or “submarine portion” of the network consists of not only the optical fiber, but also EDFA (erbium-doped fiber amplifiers). Standard OTDR technology is no longer viable due to these amplifiers. EDFA only amplify in the forward direction and employ components that are unidirectional; therefore, the backscattered light is not able to return via its original path. Rather, a Coherent OTDR (C-OTDR), such as the one shown in Figure 1, is now required for installing and maintaining today’s submarine optical networks.

C-OTDR Advantages

A C-OTDR (Figure 1) works on the same basic principles of an OTDR. It transmits light into the fiber and then records the reflections (or backscatter) from the fiber under test. It has the added ability to transmit on an adjustable narrow wavelength, which allows the unit to be used in a live network alongside customer traffic within the DWDM network. There are two other significant advantages.

The first is the input of the C-OTDR is filtered to remove the active DWDM channels as well as extra noise. A more

important difference is that a C-OTDR can conduct coherent detection, which is a method of re-injecting the original transmitted wavelength, allowing the resultant to show only information at exactly that wavelength. This method removes all other noise, creating a significant signal-to-noise improvement, including reconstruction of data from well below the normal noise floor.

A submarine system uses multiple DWDM channels to increase the amount of traffic between two locations. To conduct a test, a C-OTDR probe pulse is assigned a DWDM channel. The C-OTDR probe pulse and a dummy pulse are normally placed far from the active traffic to minimize any chance of interference. The dummy pulse occupies a second channel commonly adjacent to the probe pulse and is required due to the automatic gain control system of the EDFA. In a live system, the input to an EDFA is at a constant power level across multiple channels while C-OTDR testing is often completed on an unlit system (i.e., no traffic).

When completing testing on an unlit system, the EDFA gain control is unable to maintain a stable output due to the pulsing power the C-OTDR presents to it. In order to avoid this problem, the C-OTDR outputs on two channels to ensure a constant input level to the EDFA. One channel generates the test pulse for a short period, while the load pulse is on for the remainder of time on the second channel. The ratio between the two is determined by the testing pulse width selected on the C-OTDR.

There is one more benefit to using a C-OTDR. A submarine network is made up of many optical amplifiers to improve the power level to the DWDM wavelengths. This also increases the Amplified Spontaneous Noise (ASE) level. Because each amplifier raises the ASE level, the coherent detection method of a C-OTDR enables it to see signals that would normally be considered hidden within or below this noise.

Testing a Severed Network

A submarine network consists of fiber pairs – direction A to B and B to A – linked by the Optical Feedback Path at each repeater. The feedback path makes it possible for the C-OTDR to receive backscatter from the cable transmitting in the opposite direction. When testing a cable that has been totally severed, the task is relatively straight forward but becomes more complicated if either of the following situations occurs:

1) Cable is severed in single direction (i.e., A to B but not B to A) – In this scenario, the distance length will appear different, depending upon the end of the network in which the test is conducted. The true fault location will only be shown when testing in the same direction as the transmission link fiber. If the test is performed from the receiver side, the fault will show the end location of the repeater directly following the cut location. This may lead to a measurement that is inaccurate by as much as the distance of the repeater sections (up to 90km).

2) Cable is totally severed in two locations – A major cause of fiber cuts is due to seabed movement. This movement can cover a large geographical area and affect a large section of

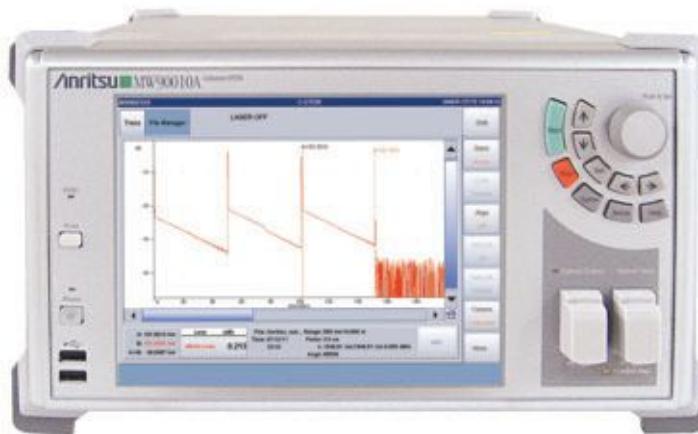


Figure 1

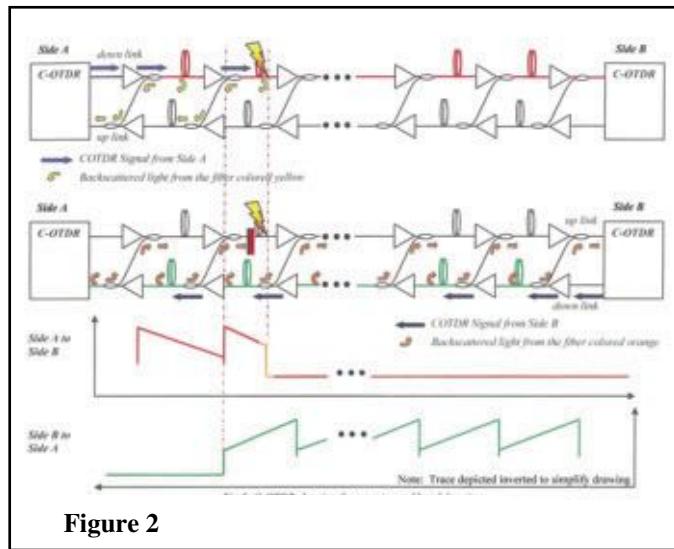


Figure 2

cable. A simultaneous cable cut in two locations can adjust the response and repair actions to be taken.

Figure 2 shows testing from different ends of the network (not completed simultaneously). From direction A, the correct fault location is able to be identified while testing from direction B is incorrect. By understanding how the C-OTDR technology and the optical feedback path work together, the true

fault location can be quickly identified. In a situation of two cuts within close proximity of each other, careful evaluation reduces the risk of deploying expensive resources unnecessarily.

A C-OTDR is important because it enables accurate fault location on any length of submarine network. The data point resolution of many traditional OTDRs is normally determined by its kilometer range setting. An OTDR with only 50,000 data points will be affected by the range setting. This becomes more critical with submarine networks as the distance of the submarine portion is several orders of magnitude larger than terrestrial networks. Due to this, the latest C-OTDRs are designed with 1.2 million data points and automatically reduce the number of points, depending on the distance range setting.

Conclusion

The C-OTDR offers the best technology for testing submarine fiber optic cables. The new generation of C-OTDRs allows for extremely accurate distance measurements as well as full characterization of optical events. The combination of coherent technology and submarine cable optical feedback path in a C-OTDR ensures that thousands of kilometers of fiber can be characterized quickly and efficiently. With some basic knowledge and a simple interface, even an inexperienced engineer can ensure the expensive task of fault restoration is completed as quickly and efficiently as possible.

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Maximizing Recovery and Enhancing Profitability at the Speed of Light

By P. Tremblay and P. J. Wright, Ocean Specialists, Inc.
(PTe. Ltd.) & Ocean Specialists, Inc

Abstract

The age of easy oil is over. No longer is it commercially appropriate to leave 50% to 70% of the identified reserves in place and unrecovered. Fortunately, ongoing developments in well technology, subsea production and seismic sensing have together provided the means to find, monitor, enhance, and control the drawdown of a field such that typical recoveries of 55% or greater of the oil in place are now achievable. And, given that the major field infrastructure is already in place, the CAPEX cost associated with producing the additional reserves is relatively minor and incremental compared with a new development.

These intelligent technologies such as Distributed Temperature Sensing (DTS), Life of Field Seismic (LoFS), Subsea Production, and others have one common theme – they provide high-quality data in much larger volumes than the sub-sea industry has historically handled. While it is possible to operate some of these technologies in a basic, low data-rate configuration, the real benefit to the operator is access to the full range of raw data in time frames appropriate to the operation being performed. So, while normal production requires relatively limited information, well test, intervention, and work-over operations want all available data, preferably in real-time. This combination of a rich data stream delivered in real-time allows the conversion of the raw data into actionable information with real operational and strategic value.

The full value of this data can only be realized when they are made available for analysis and interpretation, which requires a high-bandwidth communication system that provides seamless, low-latency data to the platform and onwards to shore. With many operators investing in advanced, complex operations centers where multi-disciplinary teams can collaborate either in person or remotely to optimize well and field performance, having the raw data available to shore adds greatly to its value. Where installed, fiber-optic backbone systems linking platforms to shore, together with satellite communication for remote facilities, provide the platform-to-shore link. But, the shorter in-field systems linking the well to the platform still typically offer only limited communication capability. Modern subsea fiber-optic communication systems, when configured appropriately for in-field application, can enable high-bandwidth communication through reliable, robust connections, but the current point-to-point communication system configuration fails to take advantage of the enhanced reliability and self-healing performance of modern ring and star system configurations that are used on a larger scale in subsea telecommunication networks and on a smaller scale for industrial controls and sensor systems.

Introduction

Estimates of average recovery of oil in place after primary and secondary recovery operations are typically in the 33% to 35% range. At the same time, a modest 1.5% increase in global oil recovery would provide for 6 - months of global consumption. With the development over the last decade of a suite of technologies and working practices aimed at improved recov-

ery, it has been demonstrated that this level of recovery can be increased to 50% or greater, with some initial reservoirs having doubled their estimate of recoverable reserves using intelligent completions technology to significantly increase the efficiency with which oil is recovered from the reservoir while minimizing the amount of oil left behind in isolated pockets. Therefore it is reasonable to forecast that for the right prospect, the use of intelligent well completions, coupled with other production monitoring and enhancement technologies such as Subsea Pumping, Life of Field Seismic, Distributed Temperature Sensing and Seafloor Compaction Monitoring, recovery rates of 55% to 60% will be relatively commonplace in the near future. For a new 500MM BOE field, an increase in recovery from 30% to 55% may result in an additional pre-tax profit approaching \$8,700MM over life of field (see Table 1).

Table 1- Effect of Additional Recovery on Pre-Tax Profits

Profit Vs % Recovery						
Oil Price (\$/bbl) Oct 2010	\$82.00	\$82.00	\$82.00	\$82.00	\$82.00	\$82.00
Field Size (Bbbl)	0.5	0.5	0.5	0.5	0.5	0.5
Lifting Cost for Offshore Oil (\$/BOE) (2008 US Offshore)	\$12.55	\$12.55	\$12.55	\$12.55	\$12.55	\$12.55
Initial Recovery %	30%	30%	30%	30%	30%	30%
Life of Field (for which the improved recovery applies)	100%	100%	100%	100%	100%	100%
Improved Recovery %	35%	40%	45%	50%	55%	60%
Additional Pre-Tax Profit (\$MM) (Ref Graph 1)	\$1,736	\$3,472	\$8,208	\$6,945	\$8,681	\$10,417
% Additional Recovery Due to Improved Communication	5%	5%	5%	5%	5%	5%
Increase in Recovery of Oil In Place from Improved Communication	0.25%	0.50%	0.75%	1.00%	1.25%	1.50%
Additional Pre-Tax Profit from Improved Communication (\$MM) (Ref Graph 2)	\$86.8	\$173.6	\$260.4	\$347.3	\$434.0	\$520.8

A speech from Malcolm Brinded, Executive Director E&P, Royal Dutch Shell plc, from the Intelligent Energy Conference, Amsterdam 25 February 2008, nicely packages the intent and the tools needed to be able to “Optimize the Field 24 hours a day.” The one area that isn’t directly addressed is the communications system that is needed to make this happen in “real-time.” This communication system needs to link the sensor with the platform with an extension to the Operations Center that may be remote from the platform and then back to the actuation system that will carry out any required changes, resulting in a new set of data to be monitored to ensure that the instigated change has the desired effect. The communications overhead for these activities can be quite high, particularly where video conferencing or monitoring using video feedback is being used. Where video conferencing is being used not only is bandwidth important, but also signal latency becomes a serious issue.

Fortunately, fiber optic communication offers very high-bandwidth capability with low latency when the communication system is configured appropriately. It also offers high reliability, particularly when installed in a ring configuration where multiple communication paths that do not normally use the same cable system are employed, as is typical for commercial telecommunications.

As Mr. Brinded stated, “Imagine for a moment, reservoirs that begin to resemble a refinery or chemical plant in our ability to control subsurface operations and monitor performance.” Maybe it’s time we started thinking about sub-surface commu-

Subsea Fiber Optics

nication in the same way we implement communication and control in a refinery or chemical plant...or any other highly automated industrial setting, namely through the installation of LANs, providing bus type networks with an Ethernet style communications protocol in place of the existing point-to point system. This work was started under the Intelligent Wells Interface Standardization (IWIS) Joint Industry Project, resulting in ISO Standard 13628-6 Subsea Production Control Systems.

In 2006, this technology began to appear in the Offshore Oil & Gas arena. Since the early 70's when the first subsea control systems were deployed, the pioneers in this industry had developed a variety of proprietary control and communication protocols. By the 1990s it had become necessary for some form of standardization to take place, permitting subsea and down-hole sensors and actuators to be developed with a common interface standard, allowing them to be used in conjunction with any suppliers subsea control system. This was addressed in 1998 by instigating the IWIS JIP, which resulted in a recommendation for a common interface between intelligent well instrumentation and subsea control systems. The recommendation was formalized when the IWIS specification was adopted as ISO Standard 13268-6. Building on IWIS, a second JIP was started in 2002 to provide a more general Subsea Instrument Interface Standardization (SIIS). Again the focus was on standardizing the interface between a Subsea Control System and Subsea Instrumentation, defining the physical and electrical/fiber-optic interfaces and providing a standard set of Fieldbus requirements and testing regime. This provided that ability to use plug-and-play instrumentation without having to define and manage the interface for each specific instrument. In 2006, the Subsea Fiber-optic Monitoring (SeaFOM) JIP was launched to promote fiber optic sensing in subsea applications.

Commercial Environment Promoting Additional Recovery of Oil in Place

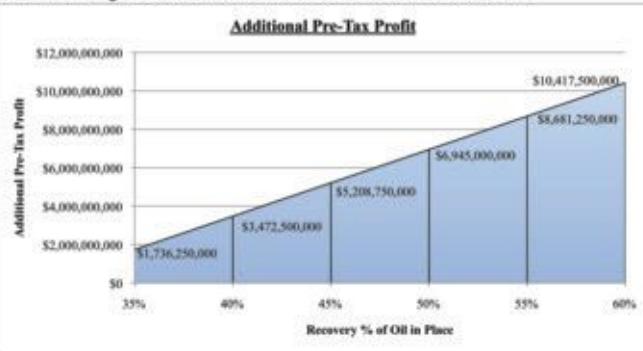
Offshore oil and gas runs at a distinct disadvantage in comparison to terrestrial production, given the very high exploration and infrastructure capital costs (Finding Cost) associated with initial oil recovery. For offshore production, the finding cost can run as high as \$60/BOE as is the case currently in the deepwater Gulf of Mexico. Given this huge up-front investment, it is even more critical that the operational profitability be maximized. This can best be achieved by efficiently and cost effectively recovering as much of the oil in place as current technology allows.

This requires potential investment in a variety of technologies that together allow for a better understanding of the reservoir and how the reservoir is changing under production draw-down conditions in real-time.

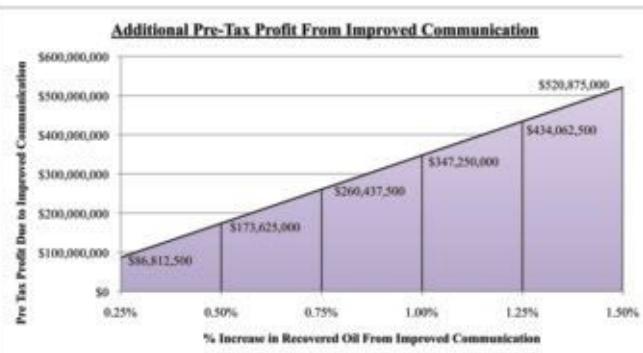
While the reservoir sensing technologies have developed greatly over the past decade, their ability to generate useful data has grown to the point where improvements in in-field communications are needed to allow the full, uncompressed data to be communicated back to the production facility and onwards to shore. Only through detailed analysis of the highest quality raw sensor data can the best reconstruction of real-time changes in the reservoir be performed.

This information needs to be shared by local production staff, global technical support staff, and vendor specialists. The use of an integrated analysis team working remotely makes the best use of critical resources in short supply while producing the highest quality decisions that can then be used to optimize real-time control over reservoir draw-down, permitting the long-term goal of continuously optimized production to be achieved.

Note: The Finding cost for US Offshore 2008 is documented as \$63.89/BOE



GRAPH 1- Additional Pre-Tax Profits from Enhanced Recovery (ref Table 1)



GRAPH 2- Additional Pre-Tax Profits from Improved Communications used to Enhance Recovery (ref Table 1)

Limitations of traditional in-field communications layout

As can be seen in the subsea field schematic shown in **Photo 1**, the typical layout has drill centers, manifolds, and satellite subsea wellheads connected back to a production facility. These connections are typically direct. The communication pathways follow this layout. Even when a connection passes through an intermediate location requiring its own communication, the various communication pathways are kept on separate electrical conductors or optical fibers. As each of these communication lines typically has a redundant, duplicate path to enhance reliability, this system suffers from costly duplication of equipment, while running all of the wires or fibers for both the primary and backup communication paths in the same Integrated Service Umbilical (ISU) (See **Photo 2**) or cable.

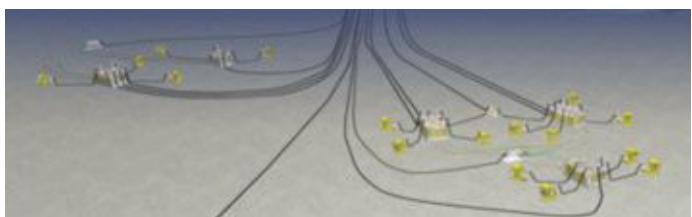


Photo 1- Typical subsea field layout

So the standard in-field communications path takes a signal from a Production Facility to a Subsea Control Module (SCM) via an ISU, Umbilical Termination Assembly, and the wet-mate connection system, including flying leads, needed to allow for separate installation of modular equipment with subsea hook-up by ROV.

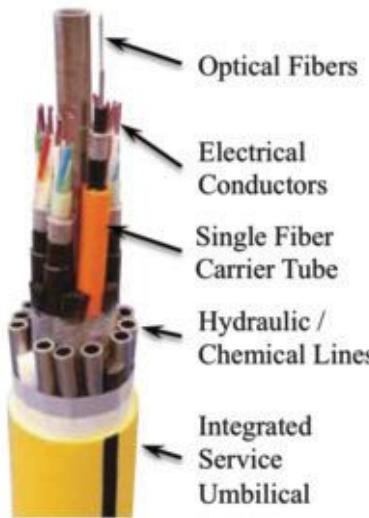


Photo 2– Integrated service umbilical

SCM will be duplicated or have duplicate power, communications and controls functions as shown in **Figure 1**.

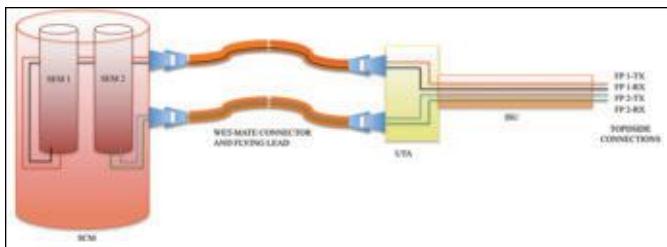


Figure 1- Typical redundant communications path

While the redundant communications path provides an increased level of reliability, it still has some vulnerability in that for much of the length of the system, both the primary and redundant pathways run side by side in the same ISU or cable. In this system, a single point, common location, or common mode failure would cause a total loss of communication with the wellhead, resulting in an emergency shut-in being instigated by the SCM. Repair of the system would need to be undertaken as a matter of urgency and would be a costly operation in addition to the fields planned maintenance.

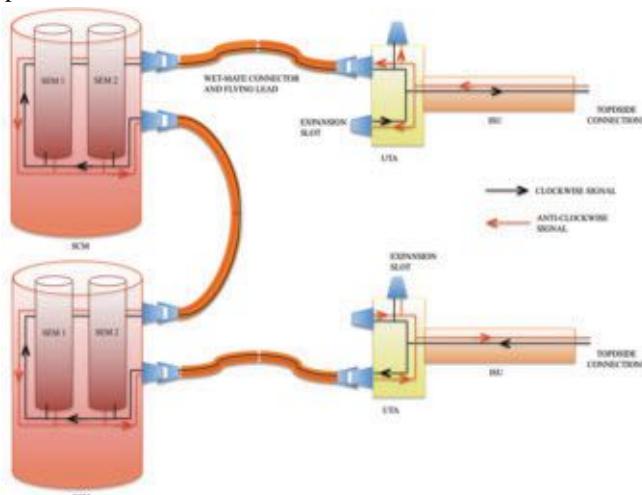


Figure 2- Ring system with redundant communication path

The SCM provides a communications and control hub for subsea, wellhead, and in-well sensors and for a variety of actuators, most typically valves. The SCM communicates periodically with each sensor and actuator, and performs data diagnostics, management, and compression before packaging the information for communication. To enhance reliability, the communication and control system is typically duplicated and the redundant system is laid alongside the primary, making use of the same ISU or cable, the same UTA, and the same SCM the Subsea Electronics Module (SEM) contained within the

Options for advanced fiber network architectures

A true ring system (Ref Diagram 2) with the same redundant capability offers the significant advantage of having both the reliability of redundant paths and the added reliability of having one or more divergent paths for communication back to the production platform. In this scenario, a common location failure that caused a loss of communication on one path would not result in a costly emergency shut-in, and the system would be capable of continuing to operate and produce until the failure could be repaired at the next scheduled work-over. This is a much less costly repair scenario. This system architecture is similar to both the most robust commercial subsea telecommunications systems and typical industrial bus network, communications and control system layouts.

The simple ring system shown below is not the only robust, self-healing, bi-directional network architecture available. There are a variety of layouts that provide the same enhanced reliability advantages (**Figure 3**).

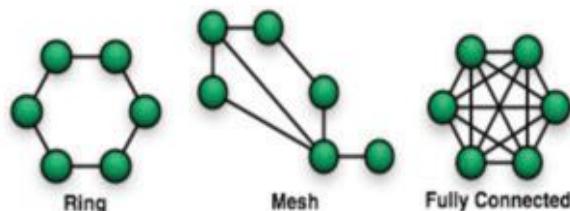


Figure 3- Fault tolerant network layouts

Benefits from Network layout

Not only does the network communications structure offer improved reliability through diverse communication paths, this system also allows for a reduction in the number of fibers and power conductors in the main ISUs, potentially reducing the cost to manufacture and install these expensive items. This is possible as all communication for one redundant channel is now carried on a single pair of fibers, with one fiber used for transmission and one for reception. One of the redundant fiber pairs will carry clockwise transmission, while the other carries anti-clockwise transmission. So, any single break at a location on the network does not prevent communication with any location on the network.

A second and potentially more important future benefit of this type of network is that, where appropriate, the data management and communications capability can be housed within the sensor system or process equipment by including a Profibus board and modem in the equipment control electronics. Now, additional equipment can be added to the subsea infrastructure without having to add additional communications capability simply by having an ROV install a wet-mateable flying lead from the new equipment to an available connection point on the installed ring. This can greatly simplify the installation or upgrade of additional subsea equipment. The use of a standard communication protocol and interface allows the connection of any vendor's third-party equipment when compliant with the common interface.

This system expansion capability needs to be included during the original system design, as expansion slots in the form of spare wet-mate connection points need to be included at targeted locations on the network. The availability of these expansion slots, or any spare connection in a fiber-enabled subsea communication system, is that high-bandwidth, low latency communication is now available to any vessel that is stationary over the field performing maintenance, work-over, or well intervention activities. Access to this high-bandwidth communication can be achieved

by installing a Portable Dynamic Riser (PDR) that provides a communications link from the vessel to the expansion slot using an available ROV for installation.

The future is happening now

One of the discussion topics from the IWIS6 JIP was related to which of the Fieldbus standards would best suit subsea control and communication. The conclusion of the working group was that Profibus offered the best starting point for a system capable of operating remote subsea infrastructure. This development has now moved beyond the feasibility study stage with the inclusion of Profibus circuit boards, developed and qualified for the subsea environment, being integrated into a major subsea production equipment suppliers SCMs.

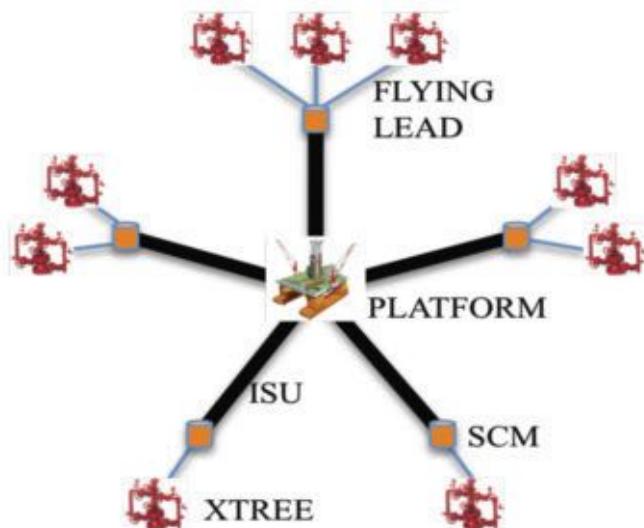


Figure 4- Field layout in a normal star configuration

This effectively creates a “Profibus work cell” communicating with the SCM. The SCM is still communicating with the production facility. While this sets up a Profibus network, the physical architecture is in reality a star configuration (**Figure 4**).

This configuration has most of the reliability issues described above for the current subsea communications layout and limits the expandability of the system as all future connections must be made into the SCM. Two additional components and a re-routing of communications would significantly increase the robustness and flexibility of the system for future communications expansion.

As shown in **Figure 5**, adding low cost cables containing electrical conductors and optical fibers between the SCM's and at specified locations where future expansion is planned, including a simple distribution frame housing standard wet-mate hybrid connectors, permit optical and electrical connections that provide the communications and power interface point for additional low power instrumentation.

Conclusions

The economics of offshore oil and gas production no longer allows for life of field recoveries in the 30% range. With increasing cost of exploration and field construction running at upwards of \$60/bbl and with production costs of \$12/bbl the only way for Offshore production to continue in a \$80/bbl market is if significant increases in both rate of recovery and total field recovery

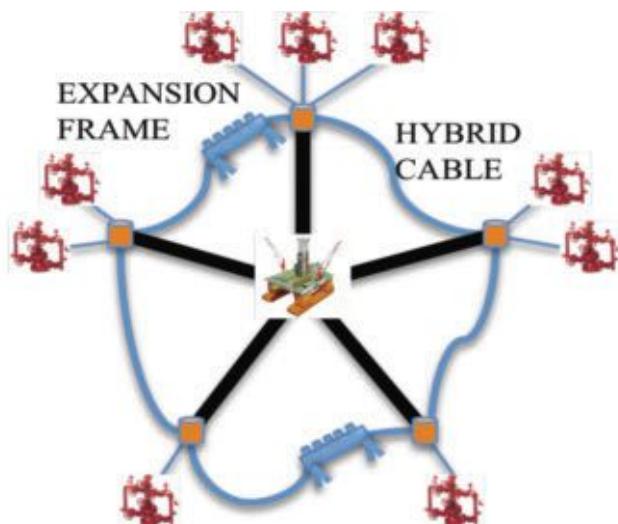


Figure 5- Fault tolerant field layout with expansion capability

are made. Fortunately, the tools to monitor and control drawdown, while enhancing production, are becoming available through industry wide intelligent wells technology developments and subsea processing programs. These tools provide an enriched data set that has real, strategic value, only if that data in their entirety are made available at the time they are needed and at remote, distributed locations to allow the operator and vendor specialists to work with them. Only then can the necessary field optimization be performed. This level of interaction needs improved communication, particularly in-field. Fortunately the tools to provide this are also available.

Actual field layouts will be project specific, but the critical feature of any network layout is that, unlike the traditional star configuration, it will provide two or more separate communication paths from the facility to the instrument being interrogated.

Advanced automation, including networked communication, when applied to subsea oil & gas infrastructure, offers improvements in the capabilities of advanced, robust distributed control systems. In such a distributed subsea layout, intelligent devices work to fulfill specific and sometimes complex tasks while improving productivity and decreasing production costs. These distributed architectures enable a high degree of flexibility, scalability and availability while supporting the seamless integration of devices and applications from a variety of manufacturers. These various devices, working together while maintaining a safe, fault tolerant working environment need a sophisticated communication system to enable their synchronized operation.

These networked communications and control systems normally use a variant of the Fieldbus protocol and subsea qualified network components. The Profibus variant on Fieldbus has been shown to be suitable for use in subsea control systems.

With the development of ever more sophisticated intelligent well instrumentation, Life of Field Seismic systems, field compaction monitoring, and an array of subsea procession and pressure boost equipment, the need for a modern, integrated, field communications infrastructure has never been so great. And as the amount and density of seafloor equipment increases, the closer the seafloor gets to resembling a shore-based industrial plant, and the more a LAN-style communications infrastructure best provides for a robust control and communication system that offers high reliability, expandability, and vendor insensitive installation.

Hydroid passes critical design review for Littoral Battlespace Sensing AUVs

Hydroid, Inc., a subsidiary of Kongsberg Maritime, the leading manufacturer of autonomous underwater vehicles, announced that it has passed critical design review (CDR) to provide Littoral Battlespace Sensing (LBS) AUVs and associated technologies to the Space and Naval Warfare Systems Command (SPAWAR). The critical design review was held to verify that Hydroid is in compliance with design maturity requirements and that detailed design preparations are in place to proceed with system fabrication, demonstration, and testing. The Navy's lead evaluator noted that the Program is progressing in a manner that will be most beneficial to the Navy and enhance the characterization of the battlespace essential to the warfare areas. The recognition of CDR is the next milestone in Hydroid's contract to provide SPAWAR with REMUS 600 AUVs equipped with technologies for meteorological and oceanographic data collection as well as technologies for processing and dissemination of these data. The ultimate end user for the contract is the Naval Oceanographic Office (NAVOCEANO), which acquires the relevant data and provides specialized services to all elements within the Department of Defense.

Austal for Cape Class Patrol Boat

Austal is pleased to announce its selection as the preferred tenderer as prime contractor for the design, construction, and through-life support of eight new vessels for the Australian Customs and Border Protection Service. The Cape Class Patrol Boat project seeks to acquire a fleet of vessels, the associated logistics support, and the in-service support



services necessary for the operational sustainment of each vessel. The contract term is expected to be 8 years from the effective date of the contract, with options to extend the term for various periods up until the expiration of the life of the vessels, which is anticipated to be 20 years.

Spruance fire

The new destroyer Spruance escaped major damage from a flash engine fire that took place 20 May, the U.S. Navy said, and the ship remains on schedule to join the fleet later this year. No personnel injuries or damage to the ship were reported. Flames leaping about 20 feet straight out of the ship's after uptakes were reported. Most of the flames appeared to have been from burning fuel and not from material combustion. The fire occurred during a routine test start for main engine number 2A, one of the ship's four General Electric LM 2500 gas turbines.

Obama orders troops home

U.S. President Barack Obama on 22 June ordered all 33,000 U.S. so-called surge troops home from Afghanistan by next summer (2012), declaring the beginning of the end of the war and vowed to turn to "nation building" at home.

NSRS reaches full operational capability



On 4 March 2011, the NATO Submarine Rescue System (NSRS) was formally granted the award of Full Operational Capability (FOC).

Designed for rapid world deployment in the event of a submarine accident, the system has been in service for over two years.

NSRS is a three-nation collaborative program providing the participants, France, Norway, and the UK, with equal shares in a Submarine Rescue Capability.

The Divex-designed and built TUP (Transfer Under Pressure) system has been designed to transfer up to 72 rescuees in two-double lock chambers and one transfer lock. Designed for careful decompression, the air-saturation system is equipped with decontamination and life support systems. The NSRS system, of which the TUP is a major component, is capable of rescuing submariners who have been trapped in submarines at depths of up to 600m below sea level.

Derek Clarke, Joint Managing Director at Divex stated: "The NATO Submarine Rescue System is the first fully air portable submarine rescue system to achieve full operational capability for unrestricted worldwide use. Divex is proud to have developed and built the Transfer Under Pressure and Decompression facilities for this world-leading system, which demonstrably improves submariner safety."

The FOC coincided with the start of at-sea operations that have seen a full air-mobilization of the Rescue and TUP system from Scotland to Norway.

Phoenix-built SAT FADS completes 1,000-ft test dive

Phoenix International Holdings, Inc. (Phoenix) designed, built, and delivered the one-of-a-kind Saturation Fly Away Diving System (SAT FADS) to the U.S. Navy's Experimental Diving Unit (NEDU) in Panama City, Florida on 30 June 2010. SAT FADS successfully completed an extended, manned, pier-side test to its design depth of 1,000 feet. This is one step in a required progression of tests that will eventually lead to its operational use.

On 18 April, six divers at NEDU entered SAT FADS and commenced pressurization to begin a 12-day stay in dry conditions that simulated a water depth of 1,000 feet. Quoting other



reports on the successful 1,000 feet test, "NEDU Commanding Officer Mark Matthews said the system operated in a near flawless manner during the extended test. Matthews said the test's main purpose was to make sure the system was habitable down to 1,000 feet." Completion of this test is anticipated to be the last step prior to manned testing at sea. Earlier, on 8 April, another Navy team successfully simulated a pier-side dry dive to 250 feet.

SAT FADS was procured by the Naval Sea System Command's Office of the Supervisor of Salvage and Diving (SUPSALV) and delivered to NEDU, Panama City, FL where the Navy is conducting manned certification testing of the system. SAT FADS will provide a critical saturation diving capability to support Navy salvage and recovery operations around the world. The system is designed to be deployed using military or commercial aircraft and commercial over-the-road tractor trailers, and can be installed on any suitable commercial vessel of opportunity. SAT FADS will support six divers to depths of 1,000 feet sea water (fsw) for 30 days. The entire system requires 40 feet x 70 feet of deck space and consists of five major components: a main deck decompression chamber, a 3-man diving bell, the bell handling system, a control van, and two auxiliary support equipment vans. Living quarters are located in the decompression chamber.

Phoenix provides manned and unmanned underwater operations, design engineering, and project management services to clients in the defense, offshore oil and gas 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, and robotic systems and tooling. Its capabilities are directed to underwater inspection, maintenance and repair, deep ocean search and recovery, submarine rescue, construction, subsea tieback, plug and abandonment, archaeological and documentary projects.

For further information, contact Tim Janaitis (tjanaitis@phnx-international.com); Tel: 301-341-7800; Fax: 301-499-0027, or visit www.phnx-international.com.

Tritech awarded major naval contract

Tritech has been contracted to supply Ultra Electronics, the defence, security, transport, and energy company, with a suite of sonar equipment over a 12-month supply program.

With delivery of the first consignment completed, Tritech is the sole supplier of the integrated homing sonar mounted on the German-designed ATLAS ELEKTRONIK Seafox, the oneshot mine disposal vehicle supplied to the Royal Navy by Ultra Electronics in support of its strategic mine hunting operations.

Mines are very cost-effective weapons that have the capability to quickly take out a substantially large and expensive warship or merchant vessel. Tritech's industry-recognized sonar equipment is the first choice for many NATO Navies mine-countermeasure and neutralization operations.

Mike Broadbent, Tritech's Business Development Manager for Defence comments: "Tritech has been supplying sonar equip-

SeaFox Vehicle, (courtesy of ATLAS ELEKTRONIK GmbH)



ment for civil and defence applications for over two decades and this new contract reflects the confidence NATO Navies and underwater vehicle manufacturers have in our sonar technology; we are proud to be playing our part in supporting this very important activity and look forward to working with Ultra Electronics on this program."

British Royal Marines get Navigators

In February, Shark Marine Technologies Inc. delivered a significant quantity of their Navigator, diver held sonar and navigation systems, to the British Royal Marines. The Navigators will be used by the marines as a Rapid Beach Profiling System (RBPS) to collect shoreline bathymetric data in advance of landing operations. The Navigators were pre-configured to be used either transom-mounted on a fast, shallow-water vessel for rapid data collection or swimmer/diver portable for stealth operations. The data collected is displayed in a format that is easily interpreted by the operator in the field and transmitted back to the command for more complete interpretation and exploitation.



The use of the Navigators will greatly enhance the rate of data collection by the Marine's reconnaissance teams as well as the overall accuracy of the data, which is also time-stamped for post processing purposes. Routes may be pre-programmed for guidance and the operator's actual track is recorded to ensure complete coverage. The collected data may then be directly overlaid onto existing charts to provide the user with a visual bathymetric profile of the shoreline for subsequent beachhead operations. The Navigators' Divelog software supports many different chart formats, including, but not limited to, GeoTiff, Electronic Navigation Charts (ENC), BSB charts, ARCS charts, and the Shark Marine Technologies map file type "Shark Map." Divelog can also import and calibrate images and satellite maps.

The processed data may be clearly displayed in two graphic formats: a beach-gradient profile or a Plan View display. The Plan View illustrates a graphic representation of the approach to the beach. An easy to read, color scale, allows the operator to clearly discern the progressive changes in depth. Movement of the cursor over an area on the display will provide the operator with the GPS co-ordinates of that location. The profile is displayed as the swimmer or boat operator traverses the bottom to allow for immediate decisions as to suitability.

For more information, visit www.sharkmarine.com.

CSA International, Inc. - More than 40 years of quality environmental programs

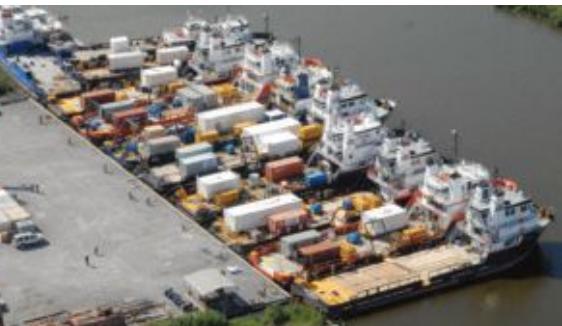
Through hard work and sacrifice, what began as one man's dream more than 40 years ago has become a leading marine environmental consulting firm with seven offices around the world and more than 100 personnel. In 1970, applied marine environmental science was a brand new and tiny niche in the then neglected environmental science market. Government regulations were more lax than they are today, and the ocean was treated more as a repository for contaminated sediments, unexploded ordinance, and appliances than as a valuable resource requiring protection. Initially, CSA International Inc.'s (CSA) goal was to provide consulting services to oil and gas companies to assist in the sustainable development of the Gulf of Mexico oil fields. From this humble beginning, CSA has developed unique capabilities and continues to expand its services commiserate with market trends and the recognition of the importance of marine resources.

Background

CSA specializes in multidisciplinary projects concerning potential environmental impacts of activities throughout the world and offers a wide variety of desktop and field survey services. Ideally headquartered just 2 hours north of Miami in Stuart on Florida's east coast, CSA has positioned itself as the premier firm for unbiased, quality environmental services and reporting. Regional offices are located in Tampa, Florida; Houma, Louisiana; Salinas, California; Houston, Texas; Port of Spain, Trinidad; and Doha, Qatar.

Unique Corporate Structure

CSA understands that the scientific methodologies and technologies required to successfully conduct marine and coastal programs are constantly evolving. As the market changes, specialized fields are emerging that require focused training and personnel. Therefore, in order to focus its



personnel and capabilities within the specific market disciplines and provide the best service to our clients, CSA has developed eight distinct business lines over the last 41 years: Energy, Navy, Coastal Permitting, Coastal Restoration, Coastal and Ocean Sciences, Coastal and Marine Services, Hazard Planning, and – the latest addition – Metocean.

Setting CSA apart from the competition is its fully functional marine services and certified diving capabilities, allowing it to perform turnkey operational projects. CSA's unique combination of Science and Operations combined with its extensive operational experience in conducting multidisciplinary surveys in support of coastal and marine environmental programs gives it an edge when conducting integrated efforts to collect physical data from the world's aquatic environments.

Services

CSA's extensive experience has been focused on providing quality services for environmental sciences and technical field operations. As such, they're staffed and equipped to offer a complete range of services for projects in offshore, nearshore, estuarine, wetland, freshwater, and terrestrial environments. The majority of their projects, both domestic and international, are multi-disciplinary and require desktop and field survey services that integrate biological, geological, physical, chemical, and socioeconomic information.

CSA's professional services include the following:

- Environmental assessments and statements (impact, social, strategic, programmatic, etc.);
- Environmental management plans;
- Marine habitat characterizations;
- Resource assessment and restoration;
- Monitoring;
- Permitting;
- Artificial reef design and installation;

- HEA/restoration cost basis evaluation;
- Fisheries studies;
- Geophysical remote sensing;
- GIS and remote sensing;
- Geotechnical sampling;
- Operational field management;
- Navigation and positioning; and
- Survey designs for emergency response.

Diving Services

The scientific, operational, and commercial dive operations at CSA are a vital component of their services and an integral part of many of its field sampling programs. All divers are certified in SCUBA by an internationally recognized organization and trained as specialty divers for utilizing enriched air (Nitrox). Additionally, all divers are trained in CPR and first aid and are experienced with federal dive safety practices. CSA's commitment to safety and quality in its dive practices is demonstrated by their superior safety record and customer satisfaction.



HSE Management

CSA has developed a comprehensive HSE Management program that aims to protect human health, avoid and prevent all accidents and incidents, and cause no damage to the environment. CSA actively manages their business activities and operations to achieve and exceed the highest international HSE standards of performance – CSA's operations are conducted in strict compliance with applicable laws, government regulations, client contractual agreements, and other requirements related to HSE.

For more detailed information on CSA's services and capabilities, visit www.csaintl.com or e-mail csa@conshelf.com.



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1-12 Channels
Single mode – Multi mode
Hermetically Sealed

Permanent Bulkhead Feedthroughs



1,000-5,000-20,000 PSI
85°C (185°F)
Hermetically Sealed
Water Proof
Single mode – Multi mode

OFFSHORE INDUSTRY

Oilfield service market expected to increase to \$200B by 2015

The global oilfield services market was valued at \$131 billion in 2009. With increased exploration and production (E&P) activity and demand for oilfield services, the market is expected to increase to an estimated \$200 billion by 2015, according to a recent GBI report titled, "The Future of the Oil Fields Services Industry to 2015 — Rebound in Exploration and Drilling Activity Drives Growth."

The global oilfield services market has witnessed considerable growth in recent years due to an increase in E&P activity and the growth in activity in offshore areas, the report says.

North America and the Middle East and Africa are the major regional markets for global oilfield service providers. The presence of huge reserves in onshore and offshore areas of these regions is the major driving factor for their dominance. This trend is expected to continue in the future due to the discovery of new resources and continued E&P activity in these regions, according to the report.

U.S. Interior 'unlawfully' held up issuing drilling permits: judge

The U.S. Department of the Interior "acted unlawfully by unreasonably delaying action" on permit requests from ATP Oil & Gas Corp., according to the Final Judgment issued by the U.S. District Court in the Eastern District of Louisiana.

The suit that resulted in the judgment concerned two permits that were submitted by ATP, but not acted on within 30 days. The permits were approved, but not until more than five months after the federal Gulf of Mexico drilling moratorium was lifted following the Deepwater Horizon disaster.

Obama to extend deepwater oil, gas leases expiring before 2016

The Obama administration will give oil and gas companies an extra year to develop their deepwater leases to make up for delays caused by last year's Gulf spill and the subsequent moratorium on some offshore drilling. The extensions will be available for non-producing leases in at least 500 feet of water that expire before 31 December 2015. Roughly 1,450 leases would qualify for the extra time.

The move responds to complaints from Gulf Coast officials and some lawmakers on Capitol Hill who say the five-month moratorium on most deepwater exploration unfairly punished oil and gas companies with no connection to the Deepwater Horizon disaster. Some lawmakers have advanced more expansive lease extension plans that also would apply to shallow water. The Obama administration did not halt shallow-water drilling after last year's spill, but oil and gas companies complained of a slowdown in government-issued permits for those projects.

Nine companies form group to address well control issues

Nine worldwide oil and gas companies have signed an interim joint development agreement to establish the Subsea Well Response Project that aims to enhance industry capability to respond to subsea well control issues. BG Group, BP, Chevron, ConocoPhillips, ExxonMobil, Petrobras, Shell, Statoil, and Total announced the project launch. Shell is the operator.

The project team will reportedly design a capping toolbox with a range of equipment to allow wells to be shut in, design additional hardware for the subsea injection of dispersant, and further assess the need for and feasibility of a containment system for shared use.

SWRP intends to complement the work done in the U.S. by the Marine Well Containment Co. and in the UK via the Oil Spill Prevention and Response Advisory Group.

Israel: Government okays ATP deepwater licenses for Med

ATP Oil & Gas Corp. (ATP), Houston, and its subsidiary ATP East Med BV have acquired the Shimshon, Daniel East, and Daniel West licenses off Israel, and the Israeli government has approved the licenses. Based on the acquired licenses, ATP through ATP East Med, anticipates spending \$3 to \$5 million in 2011 off Israel for acquisition costs, seismic, and preliminary exploration plans.

ATP East Med, as operator, has assumed the drilling contract with Transocean Drilling Israel Ltd. for the Sedco Express drilling unit at the Shimshon location.

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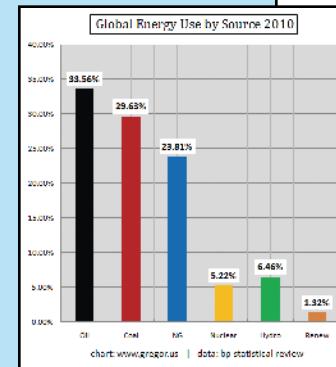
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China overtakes U.S. as top energy consumer; world demand grows

China became the world's largest energy consumer in 2010, overtaking the U.S. during a year which saw the rebound in the global economy drive consumption higher and at a rate not seen since the aftermath of the 1973 oil price shocks, according to the 60th annual BP Statistical Review of World Energy

The report says demand for all forms of energy grew strongly in 2010, and increases in fossil fuel consumption suggest that global carbon dioxide (CO₂) emissions from energy use rose at their fastest rate since 1969. The growth in energy consumption was broad-based.

Global oil reserves rose by 6.6 billion barrels to 1,383 billion barrels last year. Increases in India, Brazil, Russia,



Uganda, Columbia, and Ghana outpaced declines in Mexico and Norway. The 2009 figure was revised higher by 44 billion bbls, due to large upward revisions in Venezuela of 39 billion bbls and smaller increases in Russia, the U.S., and Libya. At the end of 2010, the global reserve-to-production (R/P) ratio was 46.2, up from 40.3 10 years prior.

In 2010, world oil production grew by 1.8 Mb/d and surpassed the level reached in 2008. Growth was the largest since 2004 and was divided evenly between OPEC and non-OPEC.

Global natural gas reserves increased by 0.5 trillion cubic meters (+0.3%) to 187.1 trillion cubic meters, while global production grew by 7.3% (217 Bcm). Production exceeded the ten-year average growth rate in all regions. Production grew rapidly in Russia (+11.6%, with the world's largest volumetric increase), and the U.S. remaining the largest producer for a second consecutive year.

Pemex makes new discovery in southern Gulf of Mexico

Petroleos Mexicanos (Pemex) said it has made a new discovery in a deepwater well in the Gulf of Mexico.

The initial tests gave a preliminary estimate of reserves in the deposit amounting to between 400 billion and 600 billion cubic feet.

The Piklis 1 well is located in the southern Gulf of Mexico and was drilled to a maximum depth of 5.4km using a semi-submersible platform leased from Gremsa for 5 years.

Pemex had contracted another offshore drilling platform under a 5-year lease from a Mexican consortium to conduct exploration in the Gulf of Mexico.

The company is also preparing a new flexible contract model to attract oil majors into the Mexican side of the Gulf and expects to have a first round of tenders on some areas by the year's end or early in 2012.

Japanese earthquake delays steel delivery to rig builder Keppel FELS

The Japanese earthquake and subsequent flooding have impacted the rig manufacturing business in Asia. Keppel FELS has notified Asia Offshore Drilling Ltd. that it is declaring a Force Majeure event regarding construction of two high-specification jack-up drilling rigs.

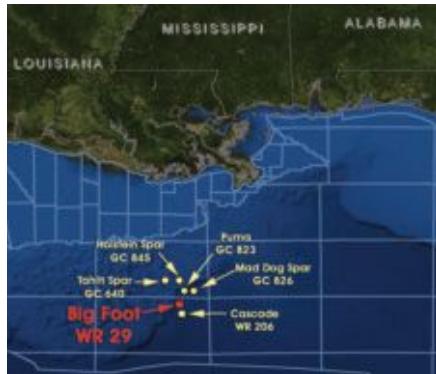
Keppel FELS said the impact on the delivery schedule is due to delays in steel arriving from Japan and that the delay would move the delivery out by 6 weeks from 1 March 2013 to 15 April 2013 on the first rig. At this time, Keppel says the second rig remains scheduled for delivery by 1 December 2012.

Chevron USA orders Big Foot well completion equipment

Chevron USA Inc. ordered from Baker Hughes Inc. electrical submersible pumps (ESPs) and production packers for seven producing wells as well as mudline packers for three injection wells for its Gulf of Mexico deepwater Big Foot development.

Baker Hughes noted that this will be the first time a company will deploy ESPs in Gulf of Mexico deepwater wells. The ESPs will be installed at about a 16,000 feet true vertical depth.

Discovered in 2006, Big Foot is in 5,200 feet of water on Walker Ridge Block 29 and is scheduled to start production in 2014. Big Foot will produce to an integrated drilling and production extended tension-leg platform with dry trees and capacity to produce 75,000 b/d of oil and 25 MMscf of gas.



Baker Hughes expects to deploy the ESPs in 2014. Baker Hughes also noted that the 1,200 hp. dual ESPs will have the highest horsepower in-well systems ever deployed offshore. The ESPs will be deployed with dual by-pass systems, allowing for reservoir access and the ability to switch between ESPs without intervention.

Chevron estimates that Big Foot contains in excess of 200 million boe of recoverable resources. Primary pay sands are Middle to Upper Miocene, ranging from 19,000 to 24,000 feet and lie below a salt canopy ranging from 8,000 to 15,000 feet thick. Chevron has a 60% working interest in the \$4 billion Big Foot project.

Shell Development confirms TSC for world's first FLNG facility

Shell Development (Australia) has authorized the Technip Samsung Consortium (TSC) to start work on the world's first floating liquefied natural gas (FLNG) facility.

TSC will provide engineering, procurement, construction, and installation for the facility, which will be moored at Shell's Prelude gas field 124 mi. offshore northwest Australia. It will produce gas offshore and liquefy it onboard by cooling.

Technip's operating centers in Paris and Kuala Lumpur will undertake detailed design, while the vessel will be built at the Samsung Heavy Industries (SHI) shipyard in Geoje, South Korea.

The Shell Prelude FLNG vessel will measure 1,601 feet from bow to stern, and when fully loaded will weigh around 600,000 tonnes.

Tax already stifling development offshore UK, survey warns

Offshore industry association Oil & Gas UK said Britain's government must act swiftly to rebuild investor confidence following the unexpected tax change in the 2011 budget. The association's updated Activity Survey reveals that 25 projects, accounting for more than 1 bboe and \$19.7 billion of investment, are now

unlikely to go ahead. The tax increase will also shorten the lifespan of at least 20 producing fields by up to 5 years, the survey claims.

Aberdeen-based analyst, Professor Alex Kemp, reported in a separate study that over the remaining life of the UK shelf, reserves of 2.25 bbl could be lost.

The survey suggests companies active on the shelf will continue with most projects they have committed to. But in the three months following the tax amendment, estimated investment in probable projects over the next decade has dropped by 30% from \$54.3 to \$37.8 billion. The tax increase has also made older fields a less attractive investment prospect.

BOEMRE strengthens offshore inspections program with teams

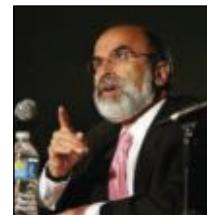
The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) will begin to use multiple-person inspection teams for offshore oil and gas inspections. This internal process improvement will attempt to improve oversight and help ensure that offshore operations proceed safely and responsibly. The new process is designed to allow teams to inspect multiple operations simultaneously and thoroughly and enhance the quality of inspections on larger facilities.

"As more inspectors are hired, we will be deploying multi-disciplinary inspection teams instead of individual inspectors, providing broader oversight to ensure that offshore operators are complying with federal regulations and conducting their operations in a safe and environmentally responsible manner," BOEMRE director Michael R. Bromwich said.

Enso completes acquisition of Pride on shareholders approval

Enso plc has completed its acquisition of Pride International, Inc. after both companies received overwhelming shareholder approvals at special meetings. The combination establishes Enso as the world's second largest offshore drilling company.

Enso's expanded rig fleet is made up of 7 ultra-deepwater drillships, 13 dynamically positioned semi-submersibles, 7 moored semi-submersibles, and 49 premium jack-ups. The ultra-deepwater fleet is the newest in the industry, and the active premium jack-up fleet is the largest of any driller.



Michael Bromwich

MWCC interim system capping stack usable in 10,000 ft of water

Marine Well Containment Co. (MWCC) said its capping stack has met the requirements for containment operations in water depths up to 10,000 feet, which is an increase from the previous water depths of up to 8,000 feet.

The capping stack is the centerpiece of an interim response containment system and is designed to cap or contain the flow of hydrocarbons in a deepwater well control incident. It can handle pressures of up to 15,000 pounds per square inch.

The capping stack provides a dual barrier for containment through a blowout preventer ram and a containment cap. Through its side valves, the capping stack can also redirect the flow of fluid to surface vessels through flexible pipes and risers, if necessary. The capping stack is tested and maintained in a continuous state of readiness for mobilization and measures approximately 30-ft. in height, 14-ft. in width and weighs almost 100 tons.

An expanded containment system is on track for delivery in 2012. In addition to operating in water depth up to 10,000 feet, the system will have the capacity to capture up to 100,000 barrels of fluid and 200 million cubic feet of gas per day.

Keppel to build semi-submersible drill rig for Floatel International

Keppel FELS has secured a contract worth \$260 million from Floatel International to build a new-generation accommodation semi-submersible drill rig that can house 500 people. Keppel O&M's Deepwater Technology Group will build the new rig based on the SSAU4000NG design with dynamic positioning (DP) 3 capability.

The SSAU4000NG is an upgrade of the SSAU 3600 design, with better capability and operability, to meet UK HSE requirements.

The enhanced station-keeping rig is capable of operating alongside fixed platforms, floating platforms, and floating production storage and offloading vessels, with a full complement of deck cranes and fire-fighting capabilities, according to Keppel. Delivery of the rig is scheduled in the first quarter of 2014.

Umbilicals ordered for Jack, St. Malo development in U.S. Gulf

Chevron USA Inc. ordered from Aker Solutions three subsea production control umbilicals for the deepwater Jack and St. Malo project in the Gulf of Mexico.

The 40 miles of electrohydraulic steel tube umbilicals will provide hydraulic, electrical, and fiber optic service to the



Federal BOEMRE revises Chukchi Sea lease sale supplemental EIS

The US Bureau of Ocean Energy Management, Regulation and Enforcement released a revised Draft Supplemental Impact Statement for the Outer Continental Shelf Lease Sale 193 in the Chukchi Sea.

The new draft is to replace a Supplemental Impact Statement prepared last fall in response to a lawsuit filed by environmental groups over the original EIS for Sale 193, which was held in 2008. Companies including Shell, ConocoPhillips, Statoil and Repsol bid over \$2 billion for leases in the Chukchi, but exploration has been held up by the lawsuit challenging the original EIS.

An Alaska US District Court ordered the Minerals Management Service, now BOEM, to add information to the original EIS on natural gas potential in the Chukchi Sea, but the agency decided earlier this year to add new information on offshore oil spill risks. The new SEIS contains an analysis of a hypothetical very large oil spill that could occur in the lease sale region, but BOEM cautioned that this will differ from a worse case discharge scenario an operator would file with an exploration plan because that would be tailored to geologic conditions known at the site.

fields that lie in 7,000 feet of water.

Aker Solutions will do the engineering, project management, and manufacturing of the umbilicals at its Mobile, Alabama, facility.

Chevron is the operator of the development and has a 50% interest in Jack (Walker Ridge Blocks 714, 715, 758, 759, and a portion of 802 and 803) and a 51% interest in St. Malo (Walker Ridge Blocks 673, 674, 677, and 678).

Chevron notes that the Lower Tertiary reservoirs at about a 26,500 feet depth in the combined fields may contain more than 500 million bbl of potentially recoverable oil. The company expects production to start in 2014 through a semi-submersible production facility with a designed capacity for handling 177,000 boe/d.

Development drilling to account for lion's share of subsea capex

Development drilling is anticipated to account for the majority of subsea total capital expenditure over the next 5 years, with the largest part of this development drilling expenditure forecasted for deep-water regions such as the U.S. Gulf of Mexico, Angola, Brazil, and Nigeria, according to a recent by Infield Systems titled, "Global Perspectives Subsea Market Report to 2015."

In addition, the report concludes that significant expenditure is expected for the detailed engineering, procurement, and construction and installation of subsea equipment such as subsea trees, manifolds, and subsea processing units.

The report highlights that operators are moving towards deeper water environments. This can be clearly seen by the number of subsea trees expected to be installed in the next 5 years.

Approximately 58% of these installations are forecast to lie in water depths of more than 500m, with a significant proportion in the ultra-deepwater environment – 1,500m water depth and greater.

The total 2011 to 2015 subsea capital expenditure is forecast to be more than \$94 billion. Compared to the previous 5-year period, 2006 to 2010, the biggest change in the top 10 country composition is the expected upturn in subsea activity in China, and, more broadly, South East Asia, according to the report.

Interior plans oil royalties overhaul, using market price based on region

The U.S. Interior Department is planning to overhaul the way it calculates royalties that energy companies owe the federal government from production of oil and gas on lands and offshore.

Interior Secretary Ken Salazar said that the department is considering a proposal to calculate royalties using a market price based on the geography of a region. The change would streamline the current royalty process in which the department conducts complicated analyses to determine the royalties owed to the government.

Royalties from oil and gas production on federal lands and beneath federal waters is a major source of non-tax revenue. Interior collected \$9.1 billion from energy-related activities in fiscal year 2010.

"These changes could dramatically improve compliance and reduce administrative costs for industry and the government as well as better ensure proper royalty valuation by creating a more transparent royalty calculation method," the department said in a statement.

Technip wins Hibernia subsea equipment contract
 Technip has received a contract from Hibernia Management and Development to provide subsea equipment for its Hibernia Southern Extension project in Canada. The project is part of the ongoing Hibernia field development located on the Grand Banks, offshore Newfoundland and Labrador. Under the contract, the company will undertake engineering, procurement, and construction services for the provision of flexible flowlines and steel tube umbilicals along with the installation of subsea equipment. The contract will be delivered by Technip's Canadian operating unit.

InterMoor gets fabrication, installation contract

InterMoor, an Acteon company, was awarded a contract for the installation of the drilling and production conductors for the Papa Terra project that has Petrobras as operator and Chevron as non-operator. InterMoor is going to be responsible for the design, procurement, fabrication, and installation of 15 conductors for the project. All 15 conductors are 36-in. in diameter. InterMoor is going to fabricate all the conductors at its new 24-acre Morgan City, Louisiana facility. The conductors are going to be installed in water depths up to 3,937 ft. off the coast of Brazil in the southern Campos Basin. The installation is scheduled to begin in the fourth quarter of 2011 utilizing DOF Subsea's construction anchor handling vessel Skandi Skolten under charter to InterMoor.

CIS wins conductor installation services contract

The UK's Conductor Installation Services (CIS) has received a contract from Weatherford Nigeria to provide a range of conductor installation services on behalf of two major operators in Nigeria. The company will provide conductor make-up and cold-cutting services and installation tooling equipment, including connection drive chasers and directional drive shoes. For the conductor-driving operations, CIS will employ two 150kJ and two 90kJ hydraulic hammers that are based permanently in Nigeria. The company already has begun the first phase of the conductor installation program, which involves driving slots for the construction of an offshore barge requiring the installation of 36 in. conductors using its 90kJ hydraulic hammer spread.

SNC-Lavalin wins Venezuela services contract

Canada's SNC-Lavalin has secured a contract from Petroleos de Venezuela to provide front-end engineering and design services for its Rio Caribe-Mejillones gas-condensate development offshore Venezuela. SNC will initially develop an early production system using a wellhead platform and floating production, storage, and offloading facilities, which will export 30,000 barrels of condensate per day. The gas will be re-injected for future recovery. In the second phase, SNC will carry out full field development comprising two further platforms, subsea wells, and a gas export pipeline to onshore Guiria. Gas production from the development will reach 600 million cubic feet per day.

ExxonMobil discoveries among largest in GoM during the past decade



ExxonMobil used the Maersk Developer to drill its first post-moratorium deepwater exploratory well in the U.S. Gulf

ExxonMobil Corp. announced two major oil discoveries and a gas discovery in the deepwater Gulf of Mexico after drilling the company's first post-moratorium deepwater exploration well.

"We estimate a recoverable resource of more than 700 million barrels of oil equivalent combined in our Keathley Canyon blocks," said Steve Greenlee, president of ExxonMobil Exploration Co. "This is one of the largest discoveries in the Gulf of Mexico in the last decade. More than 85% of the resource is oil with additional upside potential."

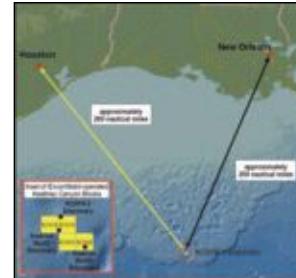
The KC919-3 wildcat well confirmed the presence of a second oil accumulation in Keathley Canyon Block 919. The well encountered more than 475 ft. of net oil pay and a minor amount of gas in predominantly Pliocene high-quality sandstone reservoirs. The well, which is continuing to drill deeper, is located 250 miles southwest of New Orleans in approximately 7,000 ft. of water, ExxonMobil said.

Drilling in early 2010 encountered oil and natural gas at Hadrian North in KC919 and extending into KC918, with over 550 ft. of net oil pay and a minor amount of gas in high-quality Pliocene and Upper Miocene sandstone reservoirs.

ExxonMobil said it encountered 200 ft. of natural gas pay in Pliocene sandstone reservoirs at its Hadrian South prospect in Keathley Canyon Block 964 during drilling in 2009.

"We plan to work with our joint venture partners and other lessees in the area to determine the best way to safely develop these resources as rapidly as possible," Greenlee said.

ExxonMobil is the operator of KC918, KC919, KC963, and KC964, with 50% working interest. Eni Petroleum US LLC and Petrobras America Inc. each hold a 25% working interest in KC919, KC963, and KC964. Petrobras America Inc. holds a 50% working interest in KC918.



EMAS AMC lays 38km umbilical for Shell

EMAS AMC in Houston recently completed the installation of 38km umbilical for Shell in the Gulf of Mexico. This project was the first to use a new 150mT Flexible Deployment System (FDS) onboard the BOA Sub C. The new FDS is capable of laying flexibles and umbilicals in water depths up to 3,000m.

The project was executed with no injuries to personnel and no recordable incidents.

The 38km by 80mm diameter Electro – Hydraulic Umbilical was installed between the Shell-operated Popeye field located at Green Canyon Block 116 (616m water depth) and Shell's Cougar platform at South Timbalier Block 300 (110m water depth) with the completion through an I-tube.

"We are very pleased to have been selected by Shell for this project and are proud of the safe and efficient work of our project team," said C. J. D'Cort, EMAS AMC's chief executive officer.

EMAS, a recognized leading global offshore contractor providing construction, marine, production, and well ser-

vices, is the operating brand of Ezra Holdings Ltd. EMAS specializes in delivering best-value solutions and has become a powerful alternative in the oil



The vessel BOA Sub C lays umbilical for Shell in the Gulf of Mexico,

and gas industry by combining a customized approach along with a widely diverse offering of assets and services to meet clients' needs. EMAS operates globally with offices in 16 locations across five continents, including Africa,

Americas, Asia Pacific, Australia, and Europe. With the \$250 million acquisition of Aker Marine Contractors in 2011, EMAS has now added one of the world's top SURF and floater installation providers with a history of renowned accomplishments to the team. EMAS's four main divisions, AMC, Energy, Marine, and Production, together execute a full spectrum of seabed-to-surface engineering, construction, marine, and production services throughout the world.

EMAS Production, under EOC Limited, owns and operates FPSO facilities. Its capabilities include FPSO conversion management and the operation and maintenance of production facilities. It possesses the capability and track record to design and provide FPSO/FSO Mooring and Riser Systems and Turrets, and Fluid Transfer Systems.

EMAS Marine manages and operates a young and diverse range of vessels, including anchor handling, towing and supply vessels; anchor handling tugs; and platform supply vessels.

Developed in direct response to customer demand for a wider angled high definition underwater video camera with no optical compromises for challenging inspection tasks such as pipe surveys, Kongsberg Maritime's new OE14-502-WA offers an angle of view up to 70° diagonal in water while retaining superb image and colour quality and none of the optical aberrations often associated with wide angle viewing.

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El Paso Corp. to spin off new E&P company with \$4.65B in assets

Natural gas pipeline giant El Paso Corp. said it will spin off its growing exploration and production business into a stand-alone public company, a move that has long been anticipated by analysts and investors.

When completed, the new company would be a mid-sized E&P company with significant acreage in a number of U.S. shale plays, including the Haynesville gas shales in Louisiana, the Eagle Ford and Wolfcamp oil shales in Texas, and Utah's Altamont oil shales.

El Paso's offshore positions include the Gulf of Mexico and Brazil.

Following the spinoff, El Paso Corp. will be made up of a natural gas pipeline business with more than 43,000 miles of pipe, midstream processing business, and general and limited partner interests in El Paso Pipeline Partners LP, a tax-advantaged publicly traded Master Limited Partnership that owns some of the pipeline assets.

The new, as-yet-unnamed company will be Houston-based with about \$4.65 billion in assets. The current head of El

Paso Exploration and Production, Brent Smolik, will be CEO.

"We believe that the creation of these two stand-alone public companies will result in significant and sustainable value creation," said Doug Foshee, chairman and CEO of El Paso.



Doug Foshee

Tullow Oil to acquire Nuon E&P, including 30 NS producing fields

Tullow Oil has signed an agreement with Vattenfall Group for the acquisition of Nuon Exploration and Production (Nuon E&P).

This \$300 million acquisition will expand the company's North Sea business by adding a portfolio of 25 licenses, which include 30 producing fields and ownership of the key infrastructure.

The newly acquired portfolio also includes near-term development and exploration opportunities. The licenses will increase Tullow's North Sea gas pro-

duction by 9,000 boe/d to approximately 23,000 boe/d, and add reserves and resources of 28 million boe.

The Nuon E&P deal is effective from Jan. 1, 2011 and was expected to be complete by July 2011.

Horizon Oil to buy 25% stake in Beibu Gulf block offshore China

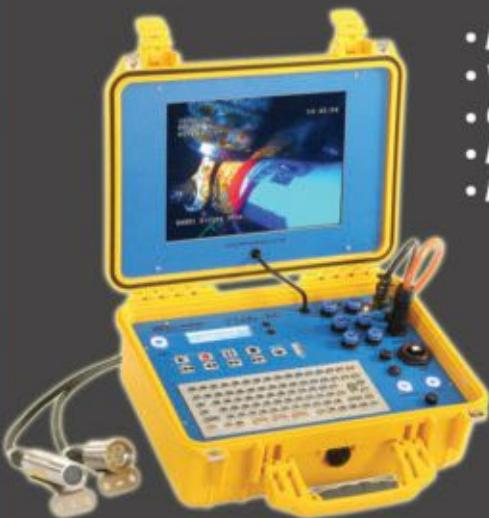
Australia's Horizon Oil has signed an agreement with Petsec Energy to acquire a 25% interest in Block 22/12 in the Beibu Gulf offshore China. The company will pay \$41 million in cash and issue 15 million options in consideration for the acquired block.

The acquisition of Block 22/12 will increase Horizon's stake in the development project to 26.95% from its current 14.7%, the company said.

Horizon plans to finance the development costs of the block by launching a \$75-\$80 million convertible bond in the Hong Kong and European bond market, reported The Australian.

Pestec will use the proceeds from the sale to develop its shale oil exploration as well as traditional drilling in the Gulf of Mexico offshore Louisiana and Texas.

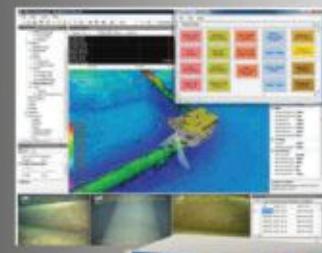
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Triops Pipeline System



McDermott awarded installation project in Mexico's Bay of Campeche

McDermott International, Inc. said that one of its subsidiaries was awarded a contract by Pemex Exploración y Producción for procurement, construction and installation of three oil and gas pipelines ranging from 8 to 20 inches in diameter, in Mexico's Bay of Campeche.

The contract is valued at more than \$50 million and was to be included in McDermott's second quarter backlog for 2011.

"Our installation solution for this project will be supported by our subsea engineering design group in Houston and fabrication work from our construction yard in Altamira, Mexico," said Stephen M. Johnson, McDermott's chairman, president and CEO. Altamira offers significant advantages for McDermott's customers such as cost efficiency and space, and with a new enclosed assembly building nearing completion.

Pipeline installation engineering was expected to begin in the second quarter of 2011, with subsequent fabrication of the risers, clamps and guards, subsea tie-in assembly, and additional platform piping and structural items from Altamira.



McDermott's DB16 will perform installation work for Pemex this year in the Bay of Campeche (Business Wire photo.)

McDermott's DB16 will perform the installation work, with completion expected by the end of the year.

DB16 is outfitted with a customized automatic welding system that offers high weld production rates and production flexibility. The vessel and its crew are recognized for producing repeatable high-quality welds with exceptional mechanical properties. Also impressive is the vessel's underwater block, capable of lifting large amounts of tonnage into deepwater.

DB16 is a dynamically positioned, shallow and deepwater combination barge with the flexibility of installing structures or S-Laying pipe up to 48-in. in diameter. The vessel is equipped with three 100 kip

tension machines and five pipelay welding stations, and an abandonment and recovery hoist for laying down pipelines in deep water. The DB16's 200-foot long deepwater truss stinger with an A-Frame and an underwater block enables it to lower heavy structures up to 62 tons into water 10,000 ft. deep, and lift up to 94.5 tons in water depths of 6,000 ft.

The field development in the Gulf of Mexico sits in approximately 170 ft of water. The pipelines will run from the Kambesah wells recoverer structure to the Kutz TA platform and the Ixtoc-A platform.



McDermott's expansive Altamira fabrication facility in Mexico

Gemini multibeam imaging sonar now rated to 4000m

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Santiago discovery to increase projected Galapagos production

Noble Energy, Inc. recently announced a discovery at the Santiago exploration prospect in the deepwater Gulf of Mexico. The well, located in 6,500 ft. of water on Mississippi Canyon Block 519, was drilled to a total depth of approximately 18,920 ft. Open-hole logging identified about 60-ft. of oil pay in a high-quality Miocene reservoir. Noble Energy is the operator at Santiago with a 23.25% working interest.

Santiago is the third discovery in Noble Energy's Galapagos project in addition to the prior successes at Santa Cruz and Isabela. Total gross resources discovered in the larger Galapagos project, including the Santiago well, are estimated by Noble Energy to be 130 million boe. Approximately 75% of the discovered resources are oil.

In late February 2011, Noble Energy received the industry's first drilling permit after the deepwater Gulf of Mexico moratorium for the Santiago prospect, where drilling was suspended in June 2010. Drilling operations resumed in early April 2011 following multiple reviews of operating and response plans as well as third-party certifications of well designs and equipment. Utilizing the Ensco 8501 drilling rig,

the company

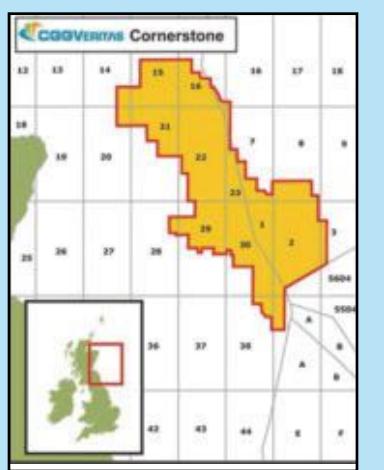


will immediately proceed with completion operations at Santiago. Those operations are expected to last about two months, after which the company is planning to return to drilling the Deep Blue prospect (Green Canyon 723). Following Deep Blue, the company is planning to spud an appraisal well at the Gunflint discovery (Mississippi Canyon 948).

Other interest owners in the Santiago discovery are Houston Energy, L.P. with 10%; Red Willow Offshore, LLC with 20.25%; and BP Exploration & Production Inc., a wholly-owned subsidiary of BP America Inc., with the remaining 46.5% interest.

Santos discovers oil in Carnarvon Basin offshore Australia

Santos has made a new oil discovery at Finucane South in the Carnarvon Basin, offshore Western Australia. Through well logs and wire line testing, Santos confirmed a net oil column of 18m in reser-



CGGVeritas applies BroadSeis to North Sea multi-client seismic survey

Acquisition is underway on CGGVeritas' 3D multi-client seismic survey in the Central North Sea.

The Quad 29 Phase 1 covers 2,100 sq km and is using the Oceanic Challenger with a 10 x 75 x 6,000m long-offset configuration.

This is CGG's first such program using BroadSeis. Trials in the North Sea showed the BroadSeis provided enrichment of detail visible in the seismic data to enhance fault mapping, lithology discrimination, and stratigraphic feature interpretation, CGGVeritas said.

The company expects the survey to image thinner, more complex reservoirs in the deep Carboniferous-Permian through the Jurassic, and up to the Paleogene, and is looking for bypassed hydrocarbons, CGGVeritas added.

voir sands in the Angel Formation. The Finucane South oil discovery is located 7km from the Fletcher oilfield and both are located within WA-191-P.

Engineering studies for the development of the two discoveries will help the WA-191-P participants to make a final investment decision before the end of 2011. Santos has considered a number of developing options that will enable first oil production from Finucane South and Fletcher by the end of 2013. Santos is operator of WA-191-P with a 33.4% interest, with Kufpec Australia, JX Nippon Oil & Gas Exploration and Tap Oil holding 33.4%, 25%, 8.2% interests, respectively.

Santos International to invest in Bangladeshi drilling activities

Santos International is to invest \$100

million in a three-well drilling program offshore Bangladesh. The announcement follows a recent decision by the Bangladeshi government to allow the marketing of new offshore gas at directly negotiated prices.

Santos President John Chambers said the drilling work will begin from October 2011, and its success will provide some relief to the present gas shortages.

The drilling activities are expected to take about two years to complete and may require additional funds, reported Reuters. Santos is operator of the Sangu hub (Block 16) under a production sharing contract and is supervised by Petrobangla.

Santos vice-president in Bangladesh Ajay Nambia said the Sangu hub is the main part of the Santos strategy in Bangladesh and is expected to deliver up to 500 million cubic feet of gas per day.

Petrobras, Statoil agree to further strengthen exploration ties

Statoil and Petrobras have signed a letter of intent to expand their cooperation in exploration.

This could take the form of joint participation in public bid rounds for new exploration acreage. Another initiative will entail a joint screening study to evaluate potential operational synergies.

A technology agreement has been in place between the two companies for some time and has led to information sharing and a joint commitment to common technology projects.

Statoil recently became a production operator off Brazil when it brought onstream Phase 1 of the Peregrino field development in Campos basin licenses BMC-7 and BMC-47.

Entek Energy makes oil discovery on Vermilion Block 342 in GoM

Australia's Entek Energy has made a new oil discovery in the first well on Vermilion Block 342 in the Gulf of Mexico. The preliminary analysis of the finding indicated the well had intersected more than 40-ft. of net oil pay in the primary L1 sand target, with an API gravity of 32°. The company said the results are in line with pre-drill predictions that estimated a potential of 4.8 million barrels of oil and 6.3 billion cubic feet of gas, and that it has no plans to test the flow rate.

Before drilling the planned total depth of 8,552 ft., Entek will run side-wall cores to gather further reservoir and oil character information, according to upstreamonline.com. Entek and Peregrine Oil & Gas each hold a 50% working interest in Vermillion block 342.

Exploration

BHP gets green light to drill U.S. Gulf of Mexico well at Shenzi project

BHP Billiton has received a permit from the BOEMRE to drill a deepwater well at its Shenzi project in the U.S. Gulf of Mexico. BHP also said it has begun producing oil from a new well in the Gulf of Mexico, the first company to do so since the Obama administration lifted a ban on deepwater drilling. The SB-201 well in the Shenzi field was brought online at the end of May and is currently producing about 17,000 bbl/d of crude oil. This is the 11th producing well in the field. The company was given access to drill a 15th development well in Green Canyon Block 653 at a water depth of 4,232 ft., located 120 miles from the coast of Louisiana.

The permit is in line with the Development Operations Coordination Document that was approved on 31 May, 2011. The Shenzi field is operated by BHP, which owns a 44% stake in the project; Hess and Repsol each own 28%.

Lundin Petroleum begins Barents Sea drilling offshore Norway

Lundin Petroleum has started drilling exploration well 7120 / 2-3 in PL438 in the Barents Sea, offshore Norway.

The well will target the Skalle prospect, which is situated to the north of the Snohvit field, and will test Cretaceous and Jurassic-Triassic sandstones of a multiple target structure.

Lundin estimates the Skalle prospect may contain unrisked, gross, prospective resources of 250 million boe.

The well will be drilled to a depth of 2,650m below mean sea level using the semi-submersible drilling rig Transocean Leader and is expected to take about 60 days to complete.

Bangladesh approves exploration plan submitted by ConocoPhillips

Bangladesh approved a plan to explore for oil and gas in two deep sea blocks by ConocoPhillips, a government adviser said.

"The firm has been permitted to explore in the deep sea blocks, and we hope to sign the production sharing contract (PSC) within two weeks so that it can begin seismic surveys and exploration in the coming winter season," said Tawfiq-e-Elahi Chowdhury, energy adviser to Prime Minister Sheikh Hasina.

He told Reuters that ConocoPhillips won the two deep sea blocks for oil and gas exploration in 2008, but could not sign the PSC with state run Bangladesh Oil, Gas and Mineral Corp., or

Petrobangla as part of these blocks was also claimed by neighboring countries.

As per the latest approval, ConocoPhillips is not allowed to explore the areas of the blocks that are claimed by Myanmar or India.

At present, Bangladesh faces acute gas shortages, with production at around 2,000 million cubic feet per day against demand of more than 2,500 mmcft a day.

The government forecasts that current gas reserves will run out in the next five years at the present consumption rate.

ConocoPhillips will invest about \$111 million and has offered a bank guarantee of the same amount for the two blocks. Energy officials say it may take 5 years for the blocks to yield results.

Kosmos Energy's Banda-1 well hits oil offshore Republic of Ghana

Kosmos Energy said the company's Banda-1 exploration well discovered oil offshore the Republic of Ghana on the West Cape Three Points Block. The results of drilling, wireline logs, and reservoir fluid samples show the Banda-1 well penetrated net oil-bearing pay of 10 ft. Oil samples recovered from the Cenomanian-age reservoir indicate oil of approximately 40° API gravity.

The Banda-1 discovery opens a new play fairway not previously encountered on the West Cape Three Points Block or adjacent Deepwater Tano Block. The Paradise-1 exploration well, recently drilled by Hess Corp., successfully penetrated a hydrocarbon-bearing, equivalent-age reservoir.

The Paradise-1 well is located 20 miles southwest of the Banda-1 well location. The Banda-1 well also was designed to test the Upper Campanian interval, which was water bearing. Additional technical evaluation will be required to analyze the impact and extent of this new play discovery, which is deeper than existing Campanian and Turonian discoveries on Kosmos' Ghana blocks.

The "Atwood Hunter" semi-submersible rig drilled the Banda-1 well in a water depth of 3,021 ft. to a total depth of 15,022 ft. in the eastern portion of the West Cape Three Points Block. The well is located 17 miles east of Kosmos' Mahogany-1 exploration well that discovered the Jubilee oil field in 2007.

Kosmos Energy is the operator of the West Cape Three Points Block in which the company holds a 30.875% interest. An affiliate of Anadarko Petroleum Corp. has a 30.875% interest; an affiliate of Tullow Oil plc has a 22.896% interest; E.O. Group

Ltd. has a 3.5% interest; Sabre Oil & Gas Holdings Ltd. has a 1.854% interest; and Ghana National Petroleum Corp. has a 10% carried interest.

Statoil adds three licenses to Indonesian exploration portfolio

Statoil has increased its presence in Indonesia by exercising farm-in options in three exploration licenses. The company will acquire a 40% equity interest in a North Makassar Strait production sharing contract (PSC) and a similar interest in two additional offshore PSCs: West Papua IV and Halmahera-Kofiau.

The three licenses will be operated by Niko Resources, and Statoil has an option to become the operator in the development and production phase following success in the exploration phase.

The agreement, which is effective from 1 January 2011, also encompasses one exploration well commitment for the North Makassar Strait PSC. The agreement is subject to government approval in Indonesia.

Statoil is the operator for the Karama offshore PSC in Indonesia and partner in the neighboring Kuma PSC in the Makassar Straits, will begin exploration on both these licenses this year.

Aminex to start fourth exploration well on Tanzania gas prospect

Aminex expects to start drilling its fourth exploration well shortly in the Nyuni PSA offshore Tanzania. The Nyuni-2 well will be drilled directionally from the small Nyuni Island via the land rig Caroil-6 in the northeast of the license area to test a large Neocomian prospect, with a bottom-hole location around 3,937 ft. southeast of the island.

Aminex has negotiated a new PSA with the Tanzanian authorities that will include four additional, contiguous blocks north of the existing PSA area. The government also has granted a 6-month extension to the existing PSA to accommodate any delays in the upcoming drilling activity.

In the nearby offshore West Songo-Songo PSA, a potential 1 tcf discovery at West Songo-Songo could be tied into a proposed gas gathering hub based around the Kiliwani North field.

Tanzania's Ministry of Energy and Minerals granted a development license for Kiliwani North in April. A 1.8 miles, 6-in. pipeline connecting the Kiliwani North wellhead to gas processing facilities on Songo-Songo Island should be installed this year, with first gas sales provisionally in early 2012.

Williams Partners to build Tubular Bells FPS in U.S. Gulf of Mexico

Tulsa, Oklahoma-based Williams Partners has received a letter of award from Hess Corp. to provide production handling services at the deepwater Gulf of Mexico Tubular Bells development, Williams said. The company will deploy its proprietary Gulfstar floating production system for the Hess-operated project in 4,300 ft. water depths at Mississippi Canyon Block 725.

The Gulfstar FPS will have a capacity of 60,000 bbl/d of oil and up to 200 mmcf/d of natural gas. The spar-based FPS will be capable of serving as a host facility for other deepwater projects in the area, Williams said.

Williams has contracted with Gulf Island Fabrication subsidiary Gulf Marine Fabricators to construct the hull in Corpus Christi, Texas. The company plans to hire an unspecified U.S. fabricator to build the topsides, making the project the first spar-based floating production system built entirely in the U.S. Gulf Coast region, Williams said.

"Gulfstar is intended to be another tool that deepwater producers can deploy for field developments that utilize proven and reliable wet-tree technology," said Rory Miller, Williams Partners mid-stream business president.

Hess Corp. operates Tubular Bells with 40% interest; partners BP and Chevron each have 30% interest. The 2003 discovery is scheduled for first production in 2014.

Tamar topsides work offshore Israel goes to Alliance Engineering

Noble Energy selected Wood Group's Alliance Engineering to carry out the detailed engineering and design services for the Tamar project offshore Israel. The contract, which Alliance announced 26 May 2011, includes the topsides facilities and deck structure.

Noble Energy's development in the Mediterranean Sea lies in the Levantine Basin. The platform will be installed in 800 ft. of water and be able to process 1.2 bcf/d of gas. The Tamar field contains an estimated 8.4 tcf of gas. Noble Energy intends to produce the gas with subsea wells connected to the platform via 150km flowlines.

The planned single-lift topsides facility will have four deck levels and will weigh nearly 10,000 tons when completed, Alliance said.

Noble Energy sanctioned the \$3 billion project on the Matan block in Sep. 2010. Noble Energy operates Tamar with 36% interest, on behalf of partners



Champion Technologies wins first West Africa deepwater contract

Specialist oilfield production chemicals company Champion Technologies has secured its first deepwater chemical management services contract in West Africa in an eight-figure deal over 5 years.

The work involves a full suite of chemicals and associated support services for Noble Energy's Aseng field development project in Equatorial Guinea.

The company plans to build a base in Luba's Freeport Zone that will include office space, a fit-for-purpose

laboratory, warehouse, and a blending facility.

"This is a significant contact award for Champion Technologies. It is the first time we have won a deepwater contract in West Africa and a lot of hard work went into securing the business," said Harry Montgomerie, EH West division manager. "We are now looking forward to mobilizing our start-up team, and we are confident of delivering a successful performance for Champion and for Noble Energy. West Africa has been a strategic target for us to expand into for some time, so we are delighted with this win."

Champion Technologies will assist Noble Energy in tackling the challenges faced in producing, storing, and transporting crude oil that has a high pour point, utilizing some of its key products from the company's flow assurance portfolio. The project will also involve the use of a deepwater FPSO that is currently located in Singapore and will be heading to Equatorial Guinea for production due to commence during the first half of 2012.

"The West Africa oil and gas market is one of the fastest growing in the world and is one of the key areas of potential growth for Champion. Therefore, it is clear how significant this contract award is to the company and our future growth plans," said Scott Knutson, Champion Technologies' Eastern Hemisphere vice president.

Isramco Negev 2 with 28.8%, Delek Drilling with 15.6%, Avner Oil Exploration with 25.6%, and Dor Gas Exploration with 4%.

Shell makes final decision to develop Cardamom field in GoM

Royal Dutch Shell plc has taken the final investment decision for the multi-billion dollar development of its deepwater Cardamom oil and gas field in the Gulf of Mexico, the Anglo-Dutch energy company said.

Shell said its plan to develop Cardamom was a "significant, multi-billion dollar investment," although it didn't specify how much and over what period of time it would be spending the money.

The Cardamom discovery is located in Garden Banks Block 427, approximately 225 miles southwest of New Orleans, Louisiana, in water more than 2,720 ft. deep. The Cardamom project is expected to produce 50,000 boe/d at peak production.

Soco gets green light to develop Te Giac Trang oil field, Vietnam

UK-based Soco has received approval from the Vietnamese government to develop the Te Giac Trang oil field.

The second phase of development includes the installation of a second unmanned production platform on the H4 fault block.

Upon completion of the second phase, the company expects the field to produce about 40,000 boe/d by next year. Soco has drilled four development wells in the field and spudded one more. All the wells were suspended and will be perforated to become producing wells once production starts as scheduled in August 2011.

The company said plateau production during the first phase of development is estimated to be about 55,000 b/d.

Soco also plans to drill three exploration wells offshore Congo (Brazzaville), with the first well to be drilled in early September.

Production

Ghana's Jubilee to produce 120,000 b/d by end of summer

Anadarko Petroleum Corp. said the massive Jubilee field off the coast of Ghana is on track to reach peak production of 120,000 bbl/d by the end of summer. Speaking to analysts on a web conference, Anadarko Vice President Operations Doug Lawler also said the company is optimistic about its ability to transition recent discoveries near Jubilee to large-scale producing assets in the next few years.

The Jubilee field, which started producing oil in December, is one of Africa's largest discoveries. Its total reserve potential is seen at nearly 1.5 billion barrels of oil equivalent.

Tullow Oil plc is the operator of the field with a 34.70% interest, while Anadarko and Kosmos Energy Ltd. each hold a 23.4913% stake. Other Jubilee co-owners include Sabre Oil and Gas, E.O. Group and state-owned Ghana National Petroleum Corp.

Oil production launched from Peregrino field offshore Brazil

Statoil has begun production from its Peregrino oil field offshore Brazil. The

operation includes an FPSO and two wellhead platforms. The Peregrino field is 53 mi offshore Brazil in the Campos basin at about 328 ft water depth in licenses BMC-7 and BMC-47. The first phase of the development includes the FPSO and two drilling and wellhead platforms. A total of 37 wells are planned on Peregrino, all of them using horizontal well technology to maximize recovery.

The field contains 300 to 600 million boe recoverable with a significant upside. An exploration well drilled nearby Peregrino recently confirmed this potential, said Statoil. Statoil holds a 60% stake in Peregrino, with the remaining 40% held by Sinochem Group.

After years of service, Cairn working to counter Ravva decline

Production from the offshore Ravva field in Indian block PKGM-1 averaged 36,942 boe/d during the 2010-11 year, according to operator Cairn India. The field completed its 16th year in service, and has yielded more than 232 million bbl of crude and 278 bcf of gas to date, more than double initial expectations, Cairn said.

To arrest production declines, the partners have performed a 4D seismic

survey over the past year and an infill drilling-workover campaign. Four infill wells have been completed so far, including one horizontal well to boost oil output. Currently, one producer and two injectors are being drilled. The infill campaign should add incremental reserves, but also increase the field's water injection capacity in the field. Initial production rates have been as prognosed.

EnQuest's North Sea production expected to jump 26% this year

EnQuest expects to average 26,500 boe/d from its UK North Sea fields, 26% above the level for 2010. Well A56/13 was drilled from the Thistle platform, reaching total depth in early April. It should enter production by mid-year.

The Don Southwest production well S8 was completed in mid-April in Area 6. Sand quality was better than prognosed. S8 will be tied into the subsea system and brought into production after the rig leaves Don Southwest this summer. Currently, the rig is completing the Area 6 injection well S9.

The Area E exploration well at Don Southwest was successful and has since been renamed the Conrie field.

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• SAN DIEGO, CA, USA	• ABERDEEN, SCOTLAND, UK	• BOOTH #818	• BOOTH #5D61	

Subsea 7 selects BMT Scientific Marine for riser monitoring systems

Subsea 7 has contracted BMT Scientific Marine Services to provide riser monitoring systems for two Hybrid Riser Towers (HRT) and one Single Hybrid Riser (SHR) for the CLOV Development Project offshore Angola operated by Total E&P Angola.

These systems will monitor the integrity of the risers by measuring the buoyancy uplift and bending fatigue, as well as each riser's motions and set-down due to lateral excursions.



Each system will include the BMT Subsea Strain Sensor Assembly; subsea data acquisition, motion, and depth modules; and a rack-mounted display with BMT's WinMon software for riser monitoring systems. Data transmission will be via a hard-wired link to the FPSO. The system will be designed for 21 years of subsea service.

BMT brings valuable experience to this project having supplied a free standing hybrid riser tower tension, motion and position monitoring system for Petrobras's P-52 platform offshore Brazil; a hybrid riser tower monitoring system for BP's Greater Plutonio Block 18; and a comprehensive integrity monitoring system for the Cascade & Chinook free standing hybrid risers (FSHRs) and disconnectable turret buoy.

The company is also currently in the process of providing a riser tower monitoring system to two single leg offset risers offshore West Africa for SAIPEM and an integrity monitoring system for four risers in the Usan Field Development Project for Total E&P Nigeria Ltd.

For more information about this system, e-mail info@scimar.com or call +1 760-737-3505.

Dresser-Rand's breakthrough in centrifugal compressor technology

In a major advance in centrifugal compressor technology, Dresser-Rand Group Inc. said it has successfully engineered, manufactured, and tested what is believed to be the world's highest density

centrifugal compressor for reinjection service. While the units will be used in the oil and gas upstream market, the technology is applicable to other market segments requiring the compression of carbon dioxide and heavy gases such as urea production and carbon capture and sequestration. The unit, which compresses a mixture of natural gas and carbon dioxide, is one of two trains that will be installed on a floating production, storage and offloading (FPSO) vessel destined for the "pre-salt" fields offshore Brazil.

The compressor was tested at full load and actual field conditions exceeding 550 bar discharge pressure and the range of specified gas compositions at the Company's facility in Olean, New York.

For information about Dresser-Rand, go to its website at www.dresser-rand.com.

CorDEX launches intrinsically safe pipeline corrosion tool

CorDEX Instruments has launched a new ultrasonic tool for detecting corrosion in pipelines that for the first time, provides the ability to build a predictive maintenance program to improve safety. The intrinsically safe tool for non-destructive testing has the ability to rapidly measure metal thickness to establish the extent of corrosion and is combined with intelligent data tracking.

The UT5000 with CorDEX Connect uses RFID technology to locate and log up to 1,000 measurements, each linked to

a specific location, date, and time. It can be used for days or weeks in the field before the data are downloaded, providing accurate corrosion analysis and helping to predict potential

failures. A unique corrosion mode helps identify thinning spots, and MultiECHO™ technology improves measurement accuracy on uneven surfaces.

Meanwhile, Apex Tubulars, the largest independent casing and tubing inspection company in Europe, has sped up the measuring of equipment with a new explosion-proof laser measure. Apex has invested in the handheld LaserMETER 3000XP from CorDEX Instruments to assist in its busy inspection program and in managing large orders being shipped around the world. The LaserMETER 3000XP is the first measuring device to be approved for use in



explosive areas, making it ideal for use offshore and in the mining and petrochemical industries. It has been built to last, with a rugged industrial-grade construction. Encased in tough aluminum, it can withstand harsh environments and has simple operating functions designed for workers wearing protective kit and gloves.

The flameproof design incorporates a shock resistant, anti-static over mould with interchangeable battery pack and backlit LCD screen. It includes features such as Pythagoras, area and volume calculations, and can measure distances of up to 30m.

For further information, contact Gayle Nicol, senior account manager, at gayle.nicol@bigpartnership.co.uk.

New drilling reamer said to save operators time and money

Paradigm Oilfield Services has launched a drilling reamer with a unique pressure-controlled on-off mechanism, enabling operators to drill ahead without having to pull the tool out of the hole to reset it. The patent-pending hydraulic Real Time Activation Drilling Reamer is triggered by standpipe pressure changes, allowing continuous drilling and potentially saving millions of dollars during multiple well operations.

"Our Real Time Activation Drilling Reamer is different from anything else in the market because of its unique blade opening and the on-off mechanism [that] can be instantly activated even when drilling thousands of feet down," said Darren Ritchie, engineering manager at Paradigm Oilfield Services. "Other tools with on-off features still depend on the operator feeding either a tag or a ball down the hole, so we believe the time saving that our rapid action pressure tool offers will be of great interest."

Paradigm also is unveiling its new patent-pending Circulation Sub with the same inside mechanism as the drilling reamer. It can be used on drill strings to aid cuttings transport, hole cleaning, increase circulation rates, and for tripping dry pipe. The unique repeatable system means the Circulation Sub can be opened and closed as many times as required downhole without waiting for a ball to land on a seat. For more information, visit www.paradigmoilfield.com.



Oilfield Equipment

Schlumberger unveils new version Techlog 2011 at annual symposium

Schlumberger has introduced a new release of Techlog 2011 at the Society of Petrophysicists and Well Log Analysts Annual Symposium.

The 2011 release sees the full implementation of GeoFrame ELAN, augmenting the existing mineral solver capabilities with the algorithms from this recognized application. Other advances include NMR and wellbore imaging upgrades. The new pore pressure prediction module incorporates industry standards to compute pore pressure and fracture gradients to establish the safe mud weight window.

The 2011 release completes modernization of the application interface that now combines intuitive icons with customization capability. A key innovation, said Schlumberger, is the dashboard mode that supports automatic window tiling to maximize the workspace and reduce mouse movements. Furthermore, an intelligent right-mouse-click in context brings up frequently used tools and actions.

"This latest release of Techlog

enables customization at several levels of granularity — from the corporate perspective, within a project; and for the petrophysicist, geoscientist or engineer," said Stephanie Gottlib-Zeh, vice president, geoscience and drilling, Schlumberger information solutions. "This ensures consistency and auditability, while still supporting productivity and personalized workflows for individual users."

Reflex Marine celebrates record demand for crew transfer devices

An increasing awareness of greater safety in marine personnel transfer has led to record demand for the FROG and TORO crew transfer devices from a recognized expert in the field, Reflex Marine.

Last year's Icelandic volcanic ash cloud, which resulted in the grounding of several helicopter flights to North Sea oil and gas platforms, led to a significant upturn in activity as numerous operators sought to plan contingencies to move crews by vessels in order to keep their operations going.

The movement of a further ash cloud from Iceland has led once again to an

increase in inquiries to the company, which is based in Aberdeen and Truro, Cornwall. The FROG and TORO are now used in all the world's major oil producing regions, including Europe, the Middle East, West Africa, the Former Soviet Union, and the Gulf of Mexico. A total of 524 have been sold by Reflex Marine worldwide.

The devices, which have set the industry standard in marine transfer, account for more than 1,000,000 crew transfers each year, and the number is ever-increasing.

In order to satisfy anticipated demand, Reflex Marine is to maintain a fleet of devices in stock worldwide.

An increase in awareness among operators of the various options and advances in personnel transfer has created an increase in acceptance of crane transfers as both a first line and contingency option for moving personnel offshore.



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The thinking ROV

An ROV that thinks for itself and can talk remotely to operators and engineers anywhere in the world is the new concept from engineers at Saab Seaeye, the world's largest electric ROV manufacturer.

Through a gateway into the heart of the vehicle, users can access diagnostics, software upgrades, and system inventory directly over an enabled web interface. Called iCON (the intelligent control of nodes), the concept enables each microprocessor (node) to report its unique status to the central control system – and take action if necessary.

Such precise and instantaneous feedback means the operator no longer has to make assumptions about the state of the ROV.

Essentially, iCON manages three modes: operational, diagnostic, and update.

In the case of a thruster, for example, the operational mode controls start, stop, speed, and direction; the diagnostic mode gives a health check and allows interrogation of parameters such as power, temperature, hours run, and vibration; the update mode allows new control software to be downloaded to the thruster when updates are available and new features are introduced.

Should an operator want to add or enhance equipment on board, interfaces have been standardized into a common unambiguous format to make the task easier.

Also, the introduction of new systems and their successful integration will be sped-up using development and de-bugging tools built around iCON.

Recognizing that an ROV works in a hazardous environment and is likely to suffer a system failure at some time, iCON brings to the ROV a new self-awareness of each device on board that makes it easier to survive the loss of one or more system or component – and keep working.

For instance, should a thruster get entangled, iCON instantly recognizes a load problem and shuts itself down. At the same time, it alerts the rest of the system so that the remaining thrusters automatically compensate for the loss of the compromised thruster and keep the ROV under control.

Before iCON, the only warning a pilot had was when the ROV started going round in circles leaving him battling for control and boosting power, unaware of the potential damage being done to the thruster.



Now the pilot can concentrate on completing the task in hand before retrieving the ROV.

Back on deck, iCON will identify the problem and the repair needed as well as what tools are required and the skill level necessary.

If required, engineers at Saab Seaeye can remotely interrogate the problem on the ROV wherever it is in the world, directly over the web, and assist the user in diagnostics and repair.

With each device constantly sensing its state of health and instantly reporting back a problem, the operator not only has greater control, but their role is made much easier and simpler.

And not only does iCON generate a system failure alert, but will predict it.

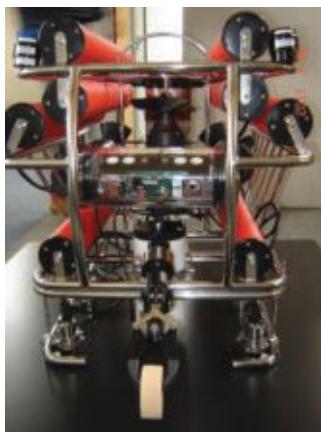
This is made possible because data are both active and historical, and therefore capable of arriving at a dynamically analytical predictive conclusion.

Usage hours on components are tracked, and problems that might be brewing highlighted. Therefore it predicts when and if a device will fail and alerts maintenance crew before a problem occurs.

It means operators are better able to keep a vehicle in operation than would otherwise be possible.

Spares management is also improved as remote examination of systems within the ROV by the operator allows him to accurately monitor both equipment and spares inventory through its part numbers and serial numbers.

For more information, visit www.seaeye.com.



Lifetime warranty

Life Time Warranty for an ROV? Yes! Why not? Clearly, this depends on the reliability of your systems. At Mariscope, it is known how reliable the systems are and, therefore, this is not an issue. As Christian Haag, the owner of the company, points out, it is important that the clients don't always need to ask the same questions: what happens once the warranty is over? What happens when the ROV ages? Do we get the spares? Will you still be able to support the revision?

Complete systems for a cost starting at €30.000 including the life time warranty, are surely an argument. Made in Germany could be another one. Technically speaking, the vehicles are equipped

with the latest technologies: three phased AC thrusters, HDTV cameras, auto depth and heading, oil in water sensors, methane sensors, and laser pointers just to name a few.

Stainless steel frames for ROV and winches make the vehicles ideal for harsh environments. The modular construction makes it easy to customize each vehicle and to adapt to customers' ideal solutions. In Europe, Aqualung has taken the representation of Mariscope for the military and professional sector, while in the U.S., Bay Tech Industries will provide customer support. Reliability is not a possibility, it is a fact.

For more information, visit www.mariscope.de/english.

CSA International, Inc. adds ROV system to its scientific fleet

CSA International, Inc. (CSA) has acquired a state-of-the-art inspection class ROV system to support its off-shore environmental and scientific fleet. The ROV has been configured to carry a high-definition (HD) video system, complete with LED lighting, sighting lasers for image sizing and measurements, and a computer-based HD video recording capability. The ROV is now on its first project in the Gulf of Mexico. Due to its compact size, the ROV system is easily shipped to both domestic and foreign locations in a cost-effective manner and is able to work from a variety of vessels.

"The recent refinement of HD video imaging and recording technology makes this ROV a powerful tool in support of our environmental and scientific surveys," stated Kevin Peterson, CEO of CSA. "We've utilized ROV systems for many years in our segment of the industry, but only recently have we been able to pull



together all of the components for HD imaging and archiving in a cost-effective and portable package."

For more information, visit www.csaintl.com.

Scripps gets H2000

Ocean Innovations announced that it supplied a mini work class ROV to Scripps Institution of Oceanography. The H2000 ROV, manufactured by DOER Marine, is a very capable system with powerful hydraulic thrusters and high bandwidth fiber optic cable. The vehicle was equipped with a five-function DOER SeaMantis manipulator, powerful LED lights, three video cameras, and a multi-beam sonar.

Scripps intends to use the vehicle on its fleet of ocean-going vessels for retrieving lost instruments, collecting samples, and other scientific tasks. With its 2,000m depth rating, 160 lb. payload capacity and 327 lb. of forward thrust, the H2000 will be up to the job. A key feature for Scripps is the vehicle's instrument manifold that is pre-wired for RS-232, RS-485, and ethernet, thus making it easy to integrate additional sensors.



For further information on the H2000, visit www.doermarine.com.

SMD selects SeeTrack CoPilot for Jan De Nul Group Fall-Pipe ROV

SeeByte, the global leader in creating smart software technology for unmanned systems, has successfully integrated SeeTrack CoPilot to an SMD Fall-Pipe ROV, providing international dredging company Jan De Nul Group unsurpassed control and performance for sub-sea rock installation.

continued next page

LARGEST RANGE OF WORKCLASS ROVS IN THE WORLD

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Underwater Intervention



Having expressed their customers' requirements for accuracy, reliability and ease of use in controlling their Fall-Pipe ROVs, SMD selected SeeByte's SeeTack CoPilot software as its tool of choice for Rock-Dumping missions. The software's advanced dynamic positioning (DP), simple point-and-click interface, and unmatched control of speed, position, and heading make it key in delivering precision for subsea Rock-Dumping tasks.

Andrew Hodgson, CEO of SMD commented, "By integrating SeeTrack CoPilot with our Fall-Pipe ROV, SMD's customers can save significant amounts of money through time-saved; this is thanks to the accuracy provided by SeeTrack CoPilot. The successful integration for Jan De Nul Group is proof that our vehicle equipped with SeeByte's software surpasses previous operation solutions for rock-dumping missions."

"This mid-water DP application is a world first," commented Ioseba Tena of SeeByte. "We are running very accurate control-and-enable fly modes that help optimize Rock-Dumping. CoPilot achieves this by using an INS aided by a USBL. This system can also be used to help mid-water DP applications using conventional work class ROV systems."

The successful integration of SeeTrack CoPilot to the SMD vehicle took place recently on the Fall-Pipe and Mining Vessel "Simon Stevin" in Bergen. Jan De Nul Group has expressed great satisfaction in the solutions provided to them by SMD and SeeByte.

For more information, visit www.seebyte.com.

Kongsberg Maritime HUGIN 1000 completes world's longest multi-sensor AUV pipeline inspection

Kongsberg Maritime has completed the world's longest multi-sensor AUV pipeline survey using one of its cutting-edge HUGIN 1000 AUVs. The pipeline inspection took place 9-11 February 2011 in the Hjelte fjord near Bergen, Norway and the HUGIN 1000 was operated from the Royal Norwegian Navy vessel HNoMS Malty.

The subject of the inspection was two subsea pipelines going to the Mongstad oil refinery. The HUGIN 1000 AUV was equipped with a an advanced suite of KONGSBERG imaging equipment, including the HISAS 1030 synthetic aperture sonar, EM3002 multibeam echo sounder, and an optical camera with LED lighting. The instruments were used to inspect around 30km of subsea pipeline in an 8-hour, two-pass mission.

ROVsim2: Next generation ROV simulators announced

Marine Simulation LLC announced the release of ROVsim2 O&G and ROVsim2 Pro — their new family of next generation undersea robotics training simulator systems. ROVsim2 reflects an important

Underwater Intervention

step in the development of 3D simulation and integrates a number of important new features and enhancements, including:

- Five new oil and gas missions, including two new anchor and suction piling support missions that can be used independently of or fully integrated with Marine Simulation's vSHIP ship simulator.
- Four new search and recovery missions, including an airliner "black box" recorder recovery mission modeled after the recent Air France recovery effort.
- A variety of new ROV tools, including 7, 5, and 3 function manipulators, cathodic potential (Cp) probe, ultrasonic thickness probe and laser measuring devices.
- Full serial communications (RS 232, RS422, etc.) support so the simulator software can be integrated into custom control consoles and send data to external devices such as chart plotters and instrument displays.
- Extended support for Windows 7 64-bit operating systems enabling even larger and more complex mission areas than before.

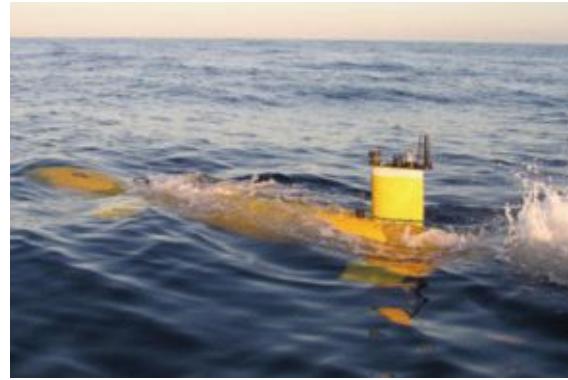
For more information, visit www.marinessimulation.com.

Fukada Salvage orders ISE Explorer AUV

ISE Ltd. has announced that Fukada Salvage and Marine Works Co. Ltd. has placed an order for an Explorer AUV. The vehicle will be used for commercial survey operations and is equipped with an EdgeTech 2200M side scan sonar and sub-bottom profiler, an R2Sonics 2022 multibeam echosounder, and a SeaBird FastCAT conductivity, temperature, and depth sensor.

The Fukada Explorer will also be supplied with a light-weight, self-articulating ramp based launch and recovery system that will be installed on one of their survey ships, the Shinkai Maru. This will enable Fukada Salvage to launch and recover their AUV up to Sea State 4.

The Explorer family of AUVs was introduced in 2003 and follows previous ISE AUVs, including ARCS and Theseus. Explorer is a modular vehicle that can be configured for commercial, scientific, or military customers. It can carry a wide range of sensors and has endurance options ranging from 12 to 85 hours. It has developed a reputation as a reliable, stable and flexible sensor platform and in total, ISE AUVs have completed more than



120,000 kilometers of surveys.

For more information, visit www.ise.bc.ca.

ECA awarded French Navy contract

Since 1981, the Montpellier division of ECA SA (France) has specialized in the design and production of robotic and CCTV systems, and namely ROVs, under the trademark ECA HYTEC™.

The French Navy has granted the design and production of a 2,000m depth-rated work class ROV, named H2000, which will be delivered in Spring 2012.

The French Navy has operated a H1000 since mid-2005, a 1,000m depth-rated work class ROV.

For more information, visit www.eca.fr.

UNDERWATER SYSTEMS

H1000

1000 m depth rated work class ROV

The main image shows the yellow ECA HYTEC H1000 work class ROV in operation, suspended in the water. It has a large cylindrical body with 'H1000' printed on it, a blue 'HYTEC' logo, and two manipulator arms at the bottom. A smaller inset image shows the ROV being lowered from a white deckhouse on a ship.

A photograph of the control room equipment, showing multiple monitors displaying video feeds and control panels.

- High performance viewing system
- Two manipulators + set of hydraulic tools
- Modular design, options simple to add

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ROV - Diverless Special Operations

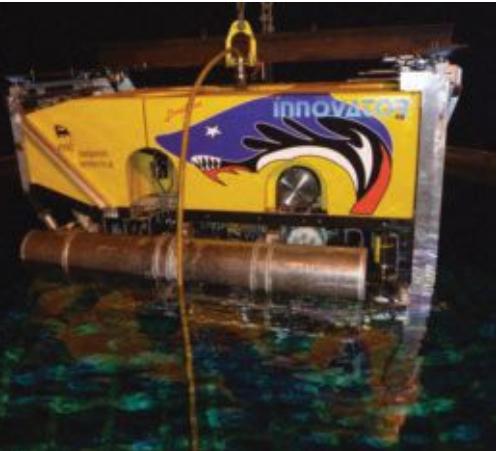
By Alessandro Vagata, Subsea Robotics Department Manager, Saipem America
(alessandro.vagata@saipemamerica.com)

Remotely Operated Vehicles (ROVs) are used for a wide variety of activities throughout the lifetime of an oil and gas field, including drilling and field development; installation and construction of production facilities; inspection, repair, and maintenance; and decommissioning.

A critical but less common use of ROVs is in support of special operations in which the ROV is in emergency response situations or in operating unique subsea equipment. For these type operations, ROVs are the diamond head of organizations capable of developing new technologies, managing risky projects, and having the right assets available.



The offshore oil and gas industry is continuously evolving, with more technically challenging projects and reaching into deeper waters, in harsher environments, and in more remote areas. As highlighted by the recent events in Gulf of Mexico, the impact of accidents can be swift and dramatic for the environment, the economy, the health of local populations, and for the safety of all offshore personnel.



Despite industry focus on prevention and reducing accident risk, experience shows these are not always possible. The ability to react immediately and effectively to unexpected events is of the utmost importance. It must be ensured that proper equipment is available, methods for interventions, are tested and organizations are prepared to face the challenges posed by these unexpected occurrences where direct human intervention is unsafe or simply not possible.

Saipem's Subsea Robotic department provides the Group with competencies in ROV, Remote Intervention Systems, and Subsea Robotics. Direct control of highly sophisticated technologies, internal R&D, design and manufacturing capabilities, competent and trained personnel, and efficient project management enable Saipem to provide quick, highly reliable, and innovative solutions to carry out complex remote operations in challenging environments, not only during normal operations but also during accident response situations. Saipem has significant experience in deepwater and ultra deepwater diverless special operations regarding recovery of contents from sunken vessels, pipeline and structure repair, and rig special maintenance and repair.

Saipem's first oil recovery was performed in 2004 in approximately 4,000m water depth. Since 2004, three additional cargo recovery operations have been performed, each presenting unique technical challenges.

Content of sunken vessels can represent an immediate or long-term threat to the environment as well as the health and economy of local populations. Challenges for removal and disposal of hazardous cargo are represented by the depth and accessibility of the wreckage, quickness/reactivity of the intervention sometimes necessary to contain major spills, hazardous environments that can be faced during the operations, and environmental issues.

In November 2002, the single-hull tanker Prestige sank at a distance of about 130 nautical miles from the north west coast of Spain. Some 13,000 tons of oil remained in the bow section at above 4,000m water depth.



ROV Innovator 150 was the "tool" to perform the recovery. It was modified in order to reach 4,000m for the first time for a heavy work class ROV. After initial survey and plugging of the main leaks, the ROV was equipped with a nucleonic level meter adapted for underwater use to measure the level of oil still present in the compartments of the tanker. In order to identify the locations where to install the extraction valves, the position of the stiffeners under the deck had to be determined. This was achieved using a specially developed ultrasound probe. To recover oil, the envisaged solution was to tap the deck of the sunken tanker. A tapping tool, which also carried the extraction valve and the drilling tool, was developed. All the systems were operated using an ROV. The flowing oil was recovered in shuttle tanks

ROV Operations



connected to the vessel. The recovery of oil from the Prestige wreck was completed within schedule, within budget, without any environmental pollution, and without any incidents or accidents.

After this first recovery of oil, Saipem successfully completed a series of other projects: Solar I tanker offshore the Philippines; Samho Brother chemical tanker in the Taiwan Strait; Eastern Bright chemical tanker, and offshore South Korea. Different challenges but same philosophy to achieve the results.

In the past three years, seven large diameter pipelines, ranging in size from 20-in. to 36-in. (36-in. CATS trunk line and 26-in. Kvitebjorn line in the North Sea, two off 24-in. offshore Egypt, 20-in. and 26-in. lines in the Mediterranean, 30-in. ADMA Oil export line in UAE), have had major damages, with severe impact on productivity and financial results of operators. Operators are becoming increasingly aware of the environmental and financial implications of possible ruptures in a pipeline and are abandoning the traditional reactive approach in favor of a more proactive one, having equipment and procedures in place in order to minimize out-of-service times for their high value assets.

ROV-operated Pipeline Repair System (PRS) is another area where Saipem is deeply involved. Starting from experiences in the Mediterranean Sea and Gulf of Mexico with the design and construction of specific pieces of equipment, Saipem is now designing and managing complete suites of remote equipment, making them available to customers during pipeline installation or to have available on demand as needed.

In order to have specific equipment available when required, operators have two options: build and maintain their own PRS or have it available on demand — as needed — as part of a PRS Club. As part of the club, the client owns his own specific equipment — clamps, connectors, spools — and will benefit of common intervention equipment such as pipe lift

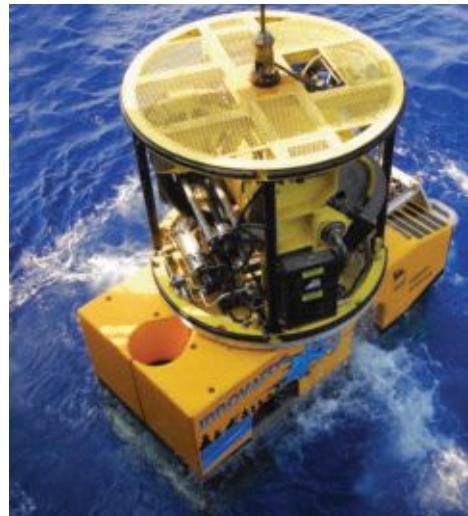
frames, cutting tools, coating removal tools, dedicated installation modules, and ancillary equipment. In addition the Club will provide project management and engineering, logistics base, availability of installation equipment, storage and maintenance, testing of equipment, training of personnel, monitoring of potential marine spread, and specific procedures/documentation. This allow to spread costs (CapEx and OpEx) across a number of operators and have proven procedures and specialized personnel for deployment of equipment.

PRS are designed for pipelines with diameters between 8-in. and 48-in. at a depth between 50 and 3,000m below sea level and in conditions of near-zero visibility on the bottom. Specifications cover pipeline made with various material grade up to API 5L X70 or equivalent, coated



with anti-corrosive coating and with a concrete weight coating thickness up to 100mm. According to the morphology of the sea bottom, the modules can operate with a transversal inclination up to 10° and longitudinal up to 15° for repairs with connectors or 30° for a Repair Clamp.

All modules are operated by an ROV through the use of the IHPU interface skid. All parameters and actuations of each module are controlled by an advanced control system that allows fully situational awareness and full



control of the equipment to the operators. Systems are designed to operate with custom issued connectors or Saipem proprietary connectors based on cold forging technology, which provides a completely diverless solution and has been DNV certified as a solution to restore functional and mechanical integrity of the pipeline.

Following customer unique requests, Saipem, thanks to the background developed on the diverless equipment, has the capacity to design, manufacture and operate a variety of diverless equipment. Pipeline repair clamps for specific intervention (FIG Williams Clamp) as well as special ROV tool for maintenance and repair of hull (BP anodes ROV pics) have been designed and put in place recently.

The approach on the diverless special operation is a firm combination of equipment and assets availability, capacity to develop quickly new technologies, and organization and planning capabilities. ROV has been demonstrated to be the fundamental tool, allowing the application of advanced technologies and knowledge to the deepwater environment.



Vizada and Thrane & Thrane enter strategic launch partnership

Vizada, the leading independent provider of global satellite-based mobility services, and hardware manufacturer Thrane & Thrane have signed a partnership agreement to launch a new broadband offer to the maritime market. Via their shared distribution channels, the partnership will offer shipping companies a unique maritime mobile broadband package that combines the strengths of Thrane & Thrane hardware with Vizada VSAT and MSS services and solutions.

SingTel satellite to expand carrier's footprint

Singapore Telecommunications Limited's (SingTel's) second satellite, ST-2, was successfully launched into orbit from Kourou, French Guiana and will greatly increase the carrier's footprint for maritime communications. ST-2 will have a wide-ranging footprint of C-band and Ku-band coverage that will cover the Middle East, Central Asia, Indian sub-continent, and South East Asia. Apart from its high-powered beams, it will also offer excellent switching capabilities to provide flexibility in meeting the demand that is required by different regions.

Nordic Maritime Singapore chooses KVH's TracPhone V7

For major commercial ship management companies like Nordic Maritime Singapore Pte. Ltd., satellite communications are a necessity, especially as the demand for bandwidth expands rapidly to support business operations, crew morale initiatives, and regulatory reporting activities. Nordic Maritime Singapore recently chose the TracPhone® V7 with mini-VSAT BroadbandSM service from KVH Industries, Inc., to support expanded e-mail, Internet, and telephone use onboard while decreasing each vessel's monthly communications costs.

KVH ships 1,000th CommBox™

KVH Industries, Inc. announced the shipment of its 1,000th CommBox™ Ship/Shore Network Manager, marking a milestone for the company and a trend of increasing integration of onboard IT networks and shipboard communications as shipping, fishing, and other commercial maritime industries worldwide are quickly becoming more advanced users of mobile satellite communications technology. The CommBox™ will soon benefit 1,000 commercial vessels around the globe, where its dedicated shipboard network management hardware, network hub options for enhanced performance and network control, and proven software modules will vastly expand onboard communications capabilities.

New Norwegian office strengthens support for Marlink customers

Global provider of maritime satellite communications Marlink announces the opening of a new customer support office in Stavanger at this year's Nor-Shipping. Based on the West Coast of Norway, the new office will accommodate Marlink's field engineers and logistics personnel and is strongly positioned to enable the company to expand support for its growing customer base in the Nordic region.

Harris Caprock wins offshore satellite communications contract

Harris CapRock Communications has been chosen by Odfjell Drilling to deliver turnkey Very Small Aperture Terminal (VSAT) communications to seven of its mobile offshore drilling rigs and drill ships currently operating in the North Sea and Africa as well as those under construction in South Korea. Communications for three of the rigs are new contracts, and the other four are renewals. The contracts are valued at approximately US\$13 million, including options.

Harris CapRock will deploy VSAT communications to enable Voice over IP (VoIP), corporate networking, Internet access, real-time monitoring and reporting, and crew infotainment services to the drilling units. The turnkey solution includes equipment, service, and 24/7 support from Harris CapRock's global infrastructure and network operation centers (NOCs).

Harris CapRock Communications is a premier global provider of managed satellite and terrestrial communications solutions specifically for remote and harsh environments, including the energy, government, and maritime markets. Harris CapRock owns and operates a robust global infrastructure that includes teleports on six continents, five 24/7 network operations centers, local presence in 23 countries, and more than 275 global field service personnel supporting customer locations across North America, Central and South America, Europe, West Africa, and Asia Pacific.

For more information, visit www.caprock.com.

Comtech EF Data, KNS integrate technologies for enhanced maritime solutions

Comtech EF Data Corporation and KNS, Inc. announced the successful technology integration of the SuperTrack Series of marine stabilized antenna systems and the ROSS Open Antenna Management (ROAM) protocol. The integration will enable the SuperTrack antenna systems on maritime vessels to roam across multiple satellite beams, maintaining connectivity while moving through different satellite footprints and enhancing communication capabilities at sea.

The ROAM protocol offers a common management interface for Comtech EF Data's Roaming Oceanic Satellite Server (ROSS) and third-party Antenna Control Units (ACUs) by providing a base set of ASCII character commands, information, interfaces, and status queries. ROSS is an integrated location server that works in conjunction with Comtech EF Data's Vipersat Management System to facilitate on-the-move satellite communications for oceanic vessels. ROSS enables remote modems to interface with stabilized, auto-tracking antennas, maintaining connectivity as vessels move through footprints of different satellites. Vessel position data, satellite signal, and management status are constantly monitored to determine when satellite hand-off is necessary.



As ROSS can support many types of ACUs, the ROAM protocol reduces the complexity and the variations by providing basic parameters required to globally roam across multiple satellite beams. The ROAM protocol provides uniformity in implementation of third-party antenna manufacturer's interfaces, while enabling the unique characteristics and proprietary techniques of different manufacturers.

KNS's SuperTrack Series of VSATs are in use and constantly challenged in the roughest seas all over world. Based on exclusive technologies, the highly advanced stabilized antennas are the most reliable and high performing maritime antennas in the market. All KNS antennas are developed specifically to stabilize broadband connection during volatile at-sea weather conditions. The antennas are built on the proven 3-axis platform that allows them to constantly track and lock in on satellite sources. With the 3-axis platform, KNS antennas are able to gyrate along the X, Y, and Z axes and move 90 degrees per second.

For more information, visit www.comtechefdata.com or www.kns.kr.

Vizada offers new maritime service

Vizada revealed the Vizada XChange, its new platform providing a secure and controlled communications environment that integrates voice and broadband data for ship operations and crew. Vizada will present and demonstrate this newest addition to their maritime portfolio at the Nor-Shipping tradeshow in Oslo, Norway.

Vizada XChange is Vizada's innovative way of managing communications that is designed to simplify the complex IT environments onboard while providing flexibility to ship operations and crew. This innovative all-in-one platform supports data, voice, VoIP, and local networks. Ships can become virtual mobile offices complete with local area networks and their own dynamic intranets for administration and crew. Ship administrators can keep an eye on communication costs by setting access authorizations for phones and Internet connections and by determining their re-billing options.

The new Vizada XChange platform consists of a box component and a user-friendly web portal. The Vizada XChange Box is an easily installed compact wall or rack mounted unit onboard the vessel, which reliably interconnects onboard IT with the corporate network. The platform incorporates voice, VoIP, and broadband data while remaining fully compatible with any maritime communications connectivity service (including Inmarsat

FleetBroadband, PharostarTM VSAT, etc.).

The onboard and onshore web portals developed by Vizada make it easy to customize settings according to the shipping company's needs and to manage all user accounts online. Ship administrators can use the Vizada XChange portals to conveniently choose their connectivity, configure access for crew and captains, re-bill, and split costs. It can provide crew with dedicated content, such as an onboard intranet or access to social networks as well as keep-in-touch apps.

For more information, visit www.vizada.com.

MTN Satellite Communications, ERZIA provide mobile VSAT communications solution

MTN Satellite Communications (MTN) and ERZIA jointly announced the installation of MTN's Rapid Deployment System (RDS), the fastest and most reliable mobile VSAT communications solution designed specifically for the maritime industry, on the Spanish research vessel BIO Hesperides. Installed in just one day, the RDS guarantees complete communications connectivity no matter the location or conditions as it travels across the Pacific from Sydney, Australia to Cartagena de Indias in Columbia for the Malaspina expedition.

The Marina Malaspina Expedition is led by the CSIC and mainly financed by the Ministry of Science and Innovation, performed in memory of the Alessandro Malaspina voyage (1789-1794). The main objective is to develop a high-resolution inventory of the global change's impact on ocean ecosystems and exploring their biodiversity, particularly in the deep ocean. As it approached the final segment of the expedition across the Pacific Ocean, the vessel required a temporary broadband satellite communications solution that could be installed within a day. The MTN/ERZIA team was able to fulfill the requirements on time given their previous experience providing support for the BIO Sarmiento de Gamboa.

The RDS solution enables offshore energy vessels to quickly establish voice and data communications using a temporary turnkey Ku-band satellite connection and VSAT equipment, delivering "Always On – Always Available" broadband communications. The RDS is designed to provide quality VSAT communications on a temporary basis to vessels that require consistent and constant remote access to global broadband.

For more information, visit www.erzia.com or www.mtnsat.com.

Onboard Wi-Fi for crew e-mail

Telaurus Communications, a Globecomm Maritime company, has unveiled an enhancement to its crew e-mail product, combining the functionality of its se@COMM suite with proprietary wireless network components.

Telaurus says that crew communications – particularly SMS and e-mail services – have developed from being an "optional extra" to an essential service for ship owners and managers serious about crew welfare. Evidence from seafarers suggests that communication while at sea not only improves morale and the overall productivity, it can make the difference between crew staying with the fleet or signing off.

The company believes that crew communications must be kept separate from ship's business, and there is a need to put the connectivity where the crew can use it safely – in the mess or other communal areas. It has addressed this need by installing a wireless access point on ships equipped with its se@COMM service to deliver true wireless connectivity to seafarers, accessible via their smartphones or laptops. The wireless access point allows for multiple computers to be introduced without the need to run extra cable. With the use of an extendable antenna unit, the connections can bridge multiple compartments without sacrificing bulkhead integrity and without interfering with ships' business.

For more information, visit www.telaurus.com.

PortVision's workboat communications and tracking service

PortVision® announced the availability of its PortVision TriMode™ workboat fleet management and business intelligence service. The web-based solution extends the company's PortVision AIS-based offering to include two-way cellular and satellite service for messaging and position reports and uses least-cost routing to cut overall expenses in half as compared to legacy satellite-only alternatives.

PortVision's TriMode service seamlessly integrates least-cost routing across three communication paths, including AIS for real-time reporting of the fleet and other AIS-enabled vessels when near shore or in-port, cellular for near-real-time reporting at very low cost whenever a vessel is within a cellular coverage area, and satellite for guaranteed reporting and text messaging whenever cellular is unavailable.

For more information, visit www.portvision.com.

Mexus Gold US updates cable recovery effort

Mexus Gold US, a company engaged in the evaluation, acquisitions, exploration, and development of mining properties and conducting salvage operations for the recovery of precious metals, is moving forward on the submarine cable recovery and has ordered from Seatronics of Houston, Texas, a deepwater magnetometer. Mexus is expecting delivery on 16 June 2011. This new magnetometer is capable of surveying at a depth of 3,000 feet, although Mexus will be using it at approximately 1,000 feet. In preparation for the magnetometer's arrival, Mexus has built a custom hydraulic retriever capable of working at this depth. Mexus expects to retrieve more than 500,000 pounds of cable in Washington waters before heading to Alaska for additional cable retrieval efforts.

PC-1 North route repair and upgrade completed after earthquake

Pacific Crossing, a wholly owned subsidiary of NTT Communications Corporation and operator of the transpacific submarine cable system PC-1, has completed repair on the PC-1 North route that links Ajigaura, Japan with Harbour Pointe, Washington, and the PC-1 West route that connects Ajigaura and Shima, Japan. The two routes were damaged during the Tohoku Earthquake on 11 March 2011. Repairs on the North route were completed on 26 May, and the company announced the completion of repairs on the West route on June 20.

First submarine cable shipment from Minato Works after earthquake

J-Power Systems shipped a 220kV 3-core XLPE submarine cable with optical fiber unit from its Minato Works located at Hitachi-city, Ibaraki prefecture on 17 April. This was the first shipment after the earthquake struck Minato Works.

Interchange outlines plans for Vanuatu cable

Vanuatu-based Internet company Interchange has detailed its plans for a new submarine fiber optic cable system that will connect the island nation to Fiji. Interchange hopes to capitalize on an opportunity in the fast-growing global connectivity market in the telecommunications industry. The company proposes to build, own, and operate a state-of-the-art submarine fiber optic cable carrying telecommunications traffic connecting Vanuatu to the global information highway.

Main One partners with Global Crossing to expand global footprint

Main One Cable Company announced its decision to deploy a new portfolio of IP-enabled services and has chosen to partner with Global Crossing, a leading global IP solutions provider, in order to bring global connectivity to its clients. This strategic agreement will enable Main One to further extend its customers' connectivity in countries where it doesn't have coverage by being part of the Global Crossing Tier 1 MPLS network that reaches more than 700 cities in more than 70 countries using Global Crossing's network of privately owned submarine cables.

Southern Cross tests 100G

A successful trial of 100 Gbps (100G) prototype transmission equipment has just been completed on the Southern Cross twin cable network. This significant technical breakthrough was demonstrated during extensive testing of the latest 40 Gbps equipment from a number of suppliers in readiness for the next Southern Cross capacity expansion targeted for 2012. Southern Cross currently uses 10 Gbps transmission equipment.

The 28,500 kilometer Southern Cross undersea cable network is a major regional asset that has been constructed at a cost exceeding US\$1.4 billion. The network provides uninterrupted international capacity to the U.S. for broadband Internet connectivity from both Australia and New Zealand.

Capacity demand out of both Australia and New Zealand is currently growing at an annual rate of 35% on the Southern Cross Network. Growth over the last 2 to 3 years is strongly driven by rapidly increasing downloads per fixed line subscriber, which have been made possible by a dramatic increase in average access speed, a massive lifting in monthly retail data caps, and continuing reductions in international capacity prices.

Southern Cross connects Australia, New Zealand, Hawaii and the West Coast of the United States in a dual ring architecture. The performance of the fibers and 500 repeaters has been better than expected and has allowed the company to extend the expected life of the cable to 2025. The company believes that 100G technology will enable the cable system's life to be extended further.

For more information, visit www.southerncrosscables.com.

Qtel connects to TGN-Gulf cable project

Qtel has announced the successful landing of the Tata Global Network (TGN) Gulf high-capacity submarine fiber optic cable in Sumaismah, north of Doha, Qatar. When the new link is fully functional by the end of the year, it will instantaneously route traffic from Qtel customers to Mumbai, India and onwards to the rest of the world via the Tata Global Network. The new cable was connected to the Qtel national network by TE SubCom.

Qtel's international connectivity strategy aims to construct a resilient cable network to enable a comprehensive broadband ICT-based society in Qatar. The successful landing of the TGN-Gulf cable will help ensure that Qtel can manage the ever-growing demand for voice and data services in Qatar.

Other TGN-Gulf project landing parties include Nawras, which is part of the Qtel Group, Bahrain Internet Exchange (in the Kingdom of Bahrain), Mobily (Kingdom of Saudi Arabia), and Etisalat (United Arab Emirates).

For more information, visit www.qtel.qa.

Subsea Telecom

One year later, SG-SCS continues flawless performance

Huawei Marine Networks, along with parent Global Marine Systems, are celebrating the first anniversary of the initial commercial deployment of the Huawei Marine Networks' innovative RPT 1660 two fiber pair Repeater and 1650 Branching Unit. The technology was implemented as part of the SG-SCS cable system in May 2010; the repeater and branching unit technology has performed flawlessly since going live over one year ago.

Due to increased bandwidth demand from South America as well as increased demand via other area submarine networks to Miami, the SG-SCS system has been seamlessly upgraded three times over the past year and is currently implementing further expansions, clearly demonstrating the flexibility and stability of the HMN technology.

A key benefit for the owners has been the ease at which new services can be simply "turned-on" with the click of a mouse, representing a simplified operational model and a robust design, the companies said in a joint statement. The SG-SCS system contains advanced ASON functionali-



ty as well as a rich service set all based upon easily upgradable (10G to 40G) Submarine Line Terminal Equipment (SLTE). HMN Network Protection Equipment (NPE) offers the customers an in-service roadmap ranging from SDH, optical wavelengths, and Gigabit/Ethernet based client services, among many others.

SG-SCS is a project jointly undertaken by Telesur of Suriname and Guyana Telephone and Telegraph Co. Ltd. It was installed by Global Marine Systems with Global Marine's joint venture partner, Huawei Marine Networks, which supplied the electronics, the innovative RPT 1660 repeaters, and the 1650 Branching Unit, used in the system.

For more information, visit www.huaweinetworks.com or www.global-marine.com.

FCC approves GOKI

The U.S. Federal Communications Commission (FCC) has approved

Subsea Cables

AT&T's application for a new submarine fiber optic cable system linking Guam and Japan.

The application is for the purpose of landing and operating a non-common carrier cable, known as the GOKI Cable Network, directly linking Tumon Bay, Guam; Okinawa, Japan; and Kyushu, Japan.

The GOKI Cable Network will be a high-capacity digital fiber-optic system with a design capacity of 40 Gbps per fiber pair on two fiber pairs, which equates to four 10 Gbps wavelengths of traffic per fiber pair. The system will provide an initial capacity of 20 Gbps.

The GOKI Cable Network will re-use some of the facilities of the former TPC-5 cable system, which was retired from service on 30 June 2010. In the future, the cable may be extended to Incheon, Korea.

AT&T will own and operate all portions of the cable system linking Guam with Japan. AT&T will also own and operate the existing cable station in Tumon Bay, Guam. In Japan, the landing points will be an existing cable station in Okinawa, Japan, which is owned and operated by KDDI Corporation, and a new

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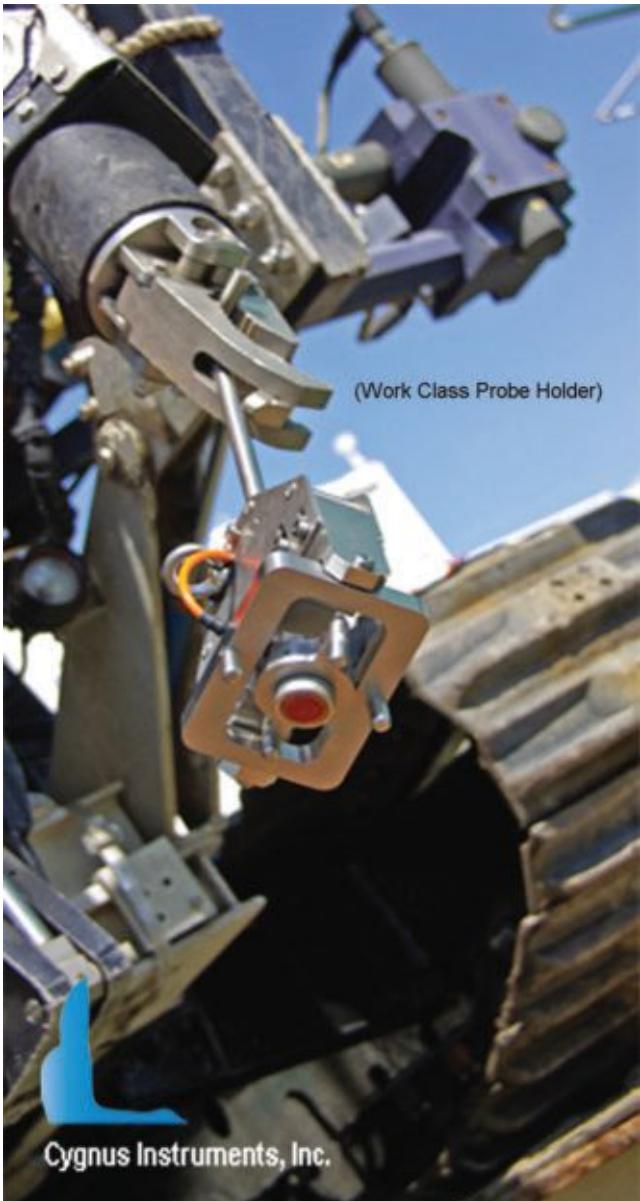
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(Work Class Probe Holder)



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Subsea Telecom

cable station in Kyushu, Japan, which will also be owned and operated by KDDI.

For more information, visit www.fcc.gov.

Project Express marks key milestone

Hibernia Atlantic has announced another important milestone in its Project Express cable build — its deep-sea submarine survey is now underway. A critical step in this historic build, the submarine survey will use specialist ships to sail the exact planned route of the cable from Brean, England to Halifax, Nova Scotia, Canada to ensure the chosen route is free of obstacles and to assess the installation techniques to be used. As the first transatlantic subsea cable build in 10 years, Project Express will offer the lowest latency route from New York to London of less than 60 milliseconds. This will be the fastest, most direct route connecting the continents since the deployment of the first telegraph cables.

Hibernia Atlantic is commencing with the survey now and accelerating to the next phase. The results of this survey will allow for Huawei Marine Networks Co., Ltd. to manufacture the cable to the exact requirements, accommodating the conditions of the seabed and ensuring its resiliency.

Project Express will be an essential route on Hibernia's Global Financial Network (GFN), which currently unites hundreds of global banks and financial exchanges with a single connection and guaranteed 100% up-time SLAs. Built for the financial community, GFN meets their demanding performance and reliability requirements. Project Express will further strengthen the GFN, reinforcing it as the fastest path across the Atlantic, with additional fast and secure links throughout North America, Europe, and Asia.

The first phase of the new build will begin with a new cable from the Brean in Somerset in the UK, to Halifax in Canada then connect to Hibernia's current low-latency cable from Halifax to Lynn near Boston and onwards to New York. In addition, the new system will include branching units for future latency enhancements to the U.S. and Continental Europe.

For more information, visit www.hiberniaatlantic.com.

Mediterranean cable enters service

Reliance Globalcom has announced the launch of its next generation submarine fiber optic cable system, called Hawk, connecting Egypt, Cyprus, and France.

PrimeTel, the leading fixed line and TV service provider of Cyprus, has become a landing station partner for the system. Hawk is a part of the world's largest singularly owned private submarine cable system, owned and managed by Reliance Globalcom. The submarine cable connecting Marseille, France to Alexandria, Egypt terminates at the newly constructed cable landing station of PrimeTel at Anatoliko, the industrial area in Paphos.

The Hawk cable system has a capacity of 2.7 Tbps and spans a distance of about 3,181km. The cable also has the potential to provide connectivity to Tunisia, Libya, Italy, Turkey, and Syria. The landing of the submarine cable also establishes Cyprus as a telecommunications hub in the eastern Mediterranean basin. In addition, PrimeTel becomes the first private telecommunications provider in Cyprus operating an independent international network infrastructure.

For more information, visit www.relianceglobalcom.com or www.primetel.com.cy.

Glo-1 goes live in Ghana

The Glo-1 submarine fiber optic cable has become operational in Ghana. The cable, owned and operated by Nigerian telecommunication carrier Globacom, will add 640 Gbps of bandwidth to Ghana's broadband infrastructure and will go a long way to support the implementation of an ICT-led socioeconomic development policy and an e-strategy plan for the government in its bid to

establish Ghana as an ICT hub within the sub-region.

Glo-1 was completed last October and extends nearly 10,000km connecting Nigeria to the UK. It is one of the first international submarine fiber optic cables to be built entirely by an Africa carrier and has signed on a number of large customers, including PCCW, Airtel Ghana, Airtel Nigeria, Cable & Wireless (Nigeria & Ghana operations), IPNX, Swift Networks, Shell, TotalElf, Chevron, United Bank for Africa, FinBank, Nigerian Bottling plc, P&G, and almost all the major media companies.

The Glo-1 system was designed to enable landings in other West African countries to expand access to high-bandwidth international infrastructure. Ghana is the first addition to the network, with Benin, Cote d'Ivoire, Gambia, and Senegal possibly following suit in the future.

For more information, visit www.gloworld.com.

Fastwave wins Subsea Energy Australia awards

Fastwave Communications, a developer of remote asset data acquisition systems, has scooped two out of five awards at the inaugural Subsea Energy Australia Awards held on 27 May 2011.

Fastwave's OceanStar subsea sensor monitoring system won the Subsea Innovation Award, recognizing the development of innovative products or services within the subsea sector and demonstrating market penetration and growth and the Standard of Excellence Award, recognizing a team or individual who has set a standard of excellence in performance or execution of a project, manufactured item, procedure, etc.

The OceanStar system provides real-time data acquisition capability from subsea sensors by integrating underwater, satellite, and Internet technologies. It offers global capability and utilizes a unique system that allows all high-value instrumentation and electronic equipment to be located on the seabed rather than in data buoys. This configuration enables simple, low cost system deployment and reduces vulnerability to extreme weather events, theft, vandalism, and collisions that can affect large data buoys. The system can be integrated with various types of sensors, depending on the application. Since 2007, OceanStar has been deployed at multiple sites in some of the most extreme and demanding marine conditions.

Earlier this year, Fastwave has entered into collaboration with L-3 Communications to develop commercial solutions for a networked underwater data



acquisition system (NUDAS) that is incorporated with the Iridium satellite system. Developing on its OceanStar system, the applications for NUDAS include subsea

infrastructure data acquisition and environmental and oceanographic monitoring.

The subsurface system utilizes a thorough-water acoustic communications technology from L-3 among distributed sensor nodes. This sophisticated signaling technology is very effective in conditions such as adverse multipath shallow water and deep water.

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

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Subsea Cables

Prysmian wins Hudson Project

Prysmian Cables & Systems has been awarded a contract worth in excess of US\$175 million by Hudson Transmission Partners, LLC for the development of a new strategic underground and submarine power link between New York City and the New Jersey transmission grid as part of a larger contract awarded to the consortium of Prysmian and Siemens Energy.

Prysmian will be responsible for the design, supply, and installation of a 345kV High Voltage Alternate Current (HVAC) land and submarine transmission line that will run along a total route of approximately 7.5 miles (13km) to transfer 660 MW of existing power from the transmission grid in Ridgefield, New Jersey to New York City. Siemens will build the back-to-back converter station located in Ridgefield, New Jersey. Completion of the project is expected to occur during the third quarter of 2013.

The Hudson Project is of strategic importance for the City of New York where energy load is constantly increasing. It will help replace resources that may be retired over the next several years as well as strengthen the overall reliability of



the power supply system in NYC as a long-term infrastructure asset. Upon completion, the Hudson Project is expected to provide New York City customers access to more diverse sources of power, including renewable sources and natural gas.

Prysmian will install a bundle of three high voltage submarine cables and two optical fiber data transmission cables under a portion of the Hudson River using its own cable-laying ship, the Giulio Verne. The submarine cable system will be buried in bundle below the river bottom at depths ranging from 10 to 15 feet using the Prysmian's designed hydro-plow machine. The submarine cables will be produced at Prysmian's plant in Arco Felice, Italy.

For more information, visit www.prysmian.com or www.hudsonproject.com.

Java-Bali contract awarded

Sumitomo Corporation and J-Power Systems Corporation (JPS), concurrently with the Indonesian branch of the Royal

Boskalis Westminster N.V., have won a contract to install submarine power cables between the Indonesian islands of Java and Bali from the Indonesia State Electricity Corporation PT. PLN.

This is a full turnkey project worth approximately 4 billion yen for the installation of two 150kV submarine power cables of about 5km in length between the islands of Java and Bali and two 150kV underground power cables of about 2.5km in length in Bali. Sumitomo will oversee the general commercial aspects of the project, while JPS will provide submarine and underground power cables and Boskalis Indonesia will conduct the installation.

The Japanese government will make yen loans available for a separate project for the construction of submarine and other power lines to connect currently independent transmission systems on the islands of Java and Sumatra. Together, these two projects are expected to facilitate the stable supply and efficient use of electricity in major Indonesian cities by connecting transmission systems from Sumatra to Bali via Java.

For more information, visit www.sumitomocorp.co.jp.

The advertisement features a man in an orange high-visibility jacket holding a small digital camera and its remote control. Text on the left reads: "The Imenco Tiger Shark remote control gives you easy camera control and fast uploading of quality images." - Odd J. Hovland, ROV Supervisor at DeepOcean AS. The Imenco logo is at the bottom left. The right side has the product name "TIGER SHARK" in large letters, followed by "THE BEST DIGITAL STILL CAMERA AVAILABLE!". A list of features includes: 14.1 Megapixel resolution, Digital still & HD-Video recording, Video out / Live view, 32Gb internal memory, New PC remote software, Easy use remote control, Built in ethernet, Timer function, Red dot lasers, Internal flash, Connector for external flash, 75° Angle of view, and 1000/3000/6000 MSW. An image of the camera body is shown with "TIGER" and "SHARK" printed on it. A circular graphic at the bottom right says "FREE IMENCO GIFT". Below the camera description, text states: "With 32 years of subsea experience, we know what an ROV pilot needs from a digital still camera. It should be reliable, easy to use, have the best software and camera control and of course give you the highest quality images. That's why we give you a **14.1mpx** resolution along with all the other features, making this the best digital still camera available today! Please visit www.imenco.com for more information and be one of the 150 people to receive a free gift."

Power Cables

Iceland examines possible cable to Europe

A pre-feasibility study on a submarine power cable between Iceland and Europe is being conducted by Landsvirkjun, an Icelandic energy company.

A submarine cable would enable the sales of renewable energy based on geothermal and hydropower sources to Europe. The study started in mid-2010 and will be completed by the end of 2011. The study evaluates the feasibility of building the world's longest submarine electric cable and addresses potential business models, markets, and congestion management.

The study focuses on the export and import of electricity based on price differences between the European and the Icelandic markets. Landsvirkjun is also studying the impact on the Icelandic power market, security of supply in the Icelandic power system and resource management in Iceland, with emphasis on the use of the hydropower capacity.

The shortest possible distance of a cable from Iceland to a landing site in Europe is about 1,200km, more than double the length of the NorNed (Norway-Netherlands) interconnector; a sub-sea cable to the continent would be around 1,900km. The transmission capacity examined is between 600 and 1,000MW. The destination countries being studied are Norway, UK, Germany, and the Netherlands.

For more information, visit www.landsvirkjun.com.

NSW, GMSL win offshore wind farm contract

Global Tech I Offshore Wind GmbH (Global Tech) signed an order with a consortium of Norddeutsche Seekabelwerke GmbH (NSW) and Global Marine Systems Ltd. (GMSL) to deliver and install over 100km of medium-voltage submarine array cables for the Global Tech I offshore wind farm. The installation work will start in late 2012, with the project scheduled to be completed in 2013.

The Global Tech I wind farm is located about 138km northwest off the German coastal city of Emden. The wind park will consist of 80 wind turbines, each rated at 5MW. Upon completion Global Tech I will supply an expected 445,000 households with renewable energy.

The package awarded to the consortium covers the production, delivery, and

installation of the infield submarine cables. NSW will manufacture and supply 122 km of medium voltage submarine array cables. The installation work, in water at around 40m depth, will be carried out by GMSL.

Global Tech I Offshore Wind GmbH is the project management company that will install and operate the offshore wind park Global Tech I. Venture partners include the two energy utilities,

Stadtwerke München GmbH and HSE AG (Darmstadt), along with the European energy trading company EGL AG and Esportes Offshore Beteiligungs GmbH. Further partners are the two project development concerns Norderland Projekt GmbH and Windreich AG as well as two subsidiaries of the Windreich group, FC Windenergy GmbH and GTU I GmbH.

For more information, visit www.globalmarinesystems.com or www.nsw.com.

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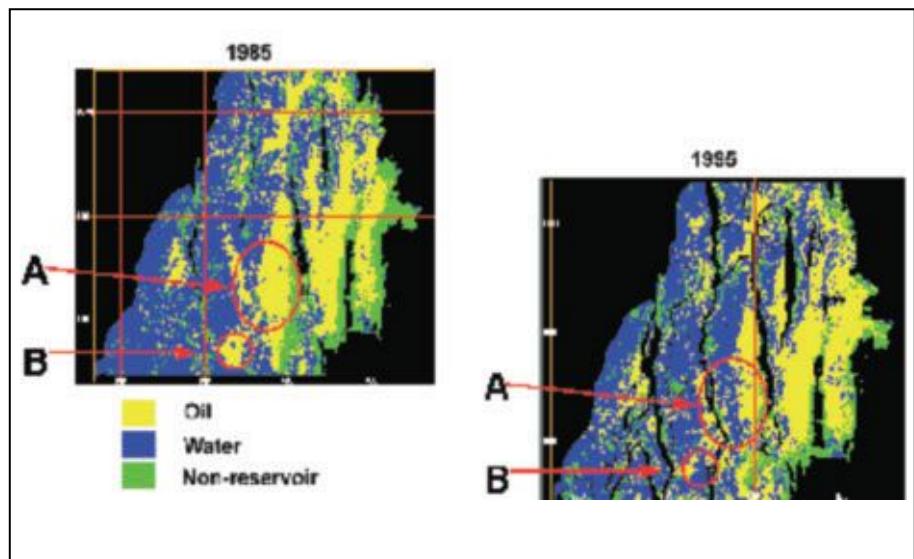
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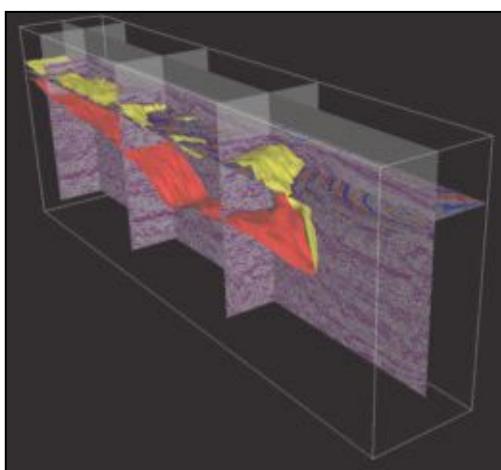
By Scott Olsen, Engineering Manager, Chariot Robotics, LLC

The quest for higher recovery rates from producing oil and gas reservoirs continues to push the demand for improvements in reservoir imaging. The success of recent operations with new data acquisition and processing systems indicate that reservoir managers now have the ability to rapidly and accurately measure production progress with unprecedented levels of confidence.

Early reservoir imaging consisted of only depth and distance data for a single cross-section of the subterranean structure. Multiple survey lines would be generated, and “stacked” in order to form an understanding of the subsurface geology. Typically, two surface vessels were utilized during a survey: one with a sound source or “gun,” and one with long “streamers” of hydrophones (or “Geophones”) to collect the reflected energy. This technique is known as “2D Seismic.”



The maps (above) of an oil reservoir were made from 3D seismic data acquired at different times over the same area to assess changes in fluid saturation with time. In 1985 (left), the areas within red outlines A and B were predominantly oil-saturated. After 10 years of oil production (1995, right), both areas show an increase in water saturation (Photo and text courtesy of www.glossary.oilfield.slb.com)



*3-D rendering of seismic image and salt body
(Prof. Gerald Gardner)*

3D seismic surveys have largely replaced 2D activities. 3D acquisition requires dense arrays of hydrophones, guns, and grid transects as well as advanced post-processing algorithms. Despite the added complexity, 3D offers a substantial improvement in reservoir visualization quality over 2D techniques. This is accomplished by building a complete picture of the reservoir in latitude, longitude, and depth.

Since the late 1990s, 4D survey techniques have become increasingly popular with reservoir managers. 4D seismic (or time-lapse 3D seismic) involves repeat acquisition of 3D data after a period of production (normally several months to a year). They are acquired at different times over the same area and provide assessment of changes in a reservoir with time. Cross-match processing identifies differences in subsequent 3D surveys.

The accuracy at which the 3D surveys are repeated is the

most important factor that determines the effectiveness of the 4D survey. A critical component of accuracy is the positional offset of the guns and streamers from one survey to the next. Differences on the order of meters can cause unwanted image distortion. Steerable streamer technologies combined with computerized vessel controls have been developed to minimize the offsets for standard surface operations.

The concept of Ocean Bottom Surveys (OBS) was introduced in order to increase the repetition accuracy for 4D surveys. Fixing the sensors on the bottom eliminates the effects of weather, tides, temperature, and navigation errors on surface-based surveys. One technique used to establish an array of sensors on the bottom is called an Ocean Bottom Cable (OBC) survey. While the implementation costs are high (data quality is improved if the cable is buried), the cost of repeated surveys is very low, especially if the number of sensors is kept to a minimum as in a “sparse” array. The number of sensors required is determined during a pre-deployment planning study and depends on the complexity of the geology and the intended use of the survey data. The planning phase may require an initial seismic survey and/or the deployment of a test cable. Future systems will employ fiber optic sensors and cables in order to minimize costs.

Ocean Bottom Node (OBN) surveys are also being used in the field. The independent nodes do not have the cost of cable burial as with an OBC. In addition, the directional sensitivity (or “vector fidelity”) of the sensors is superior due to the lack of sediment disturbance normally incurred during the burial of the OBC cables. In addition, data from nodes do not experience the “antenna” influence that is caused by the copper cables currently in use for OBC surveys.



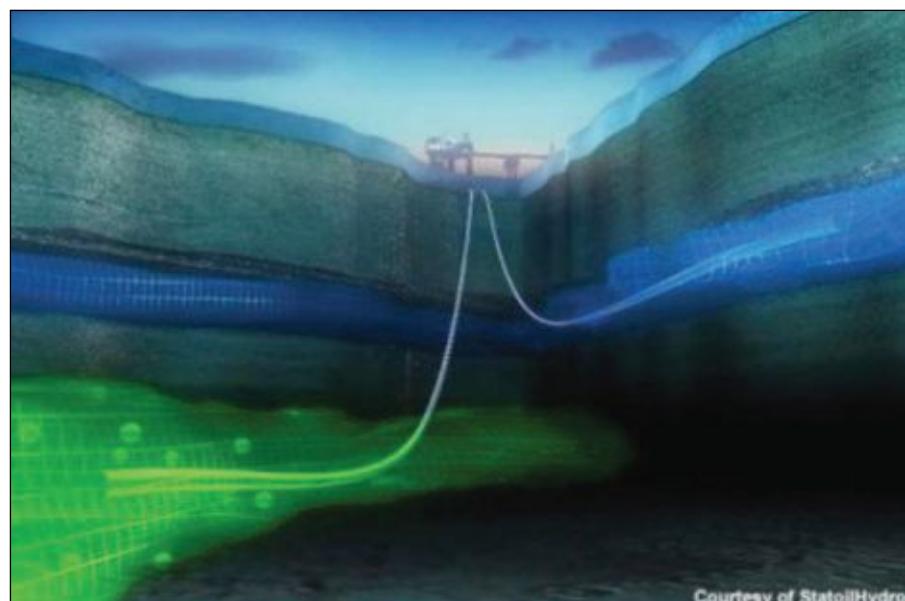
*Deployed CASE Node
(Seabird Exploration)*

OBN systems can be placed in and around existing infrastructure, the array can be easily re-positioned or the configuration modified; sensor replacement is greatly simplified and the sensors can be more accurately placed in both the vertical axis and the compass orientation during deployment.

ROVs are used to position the nodes at a rate of up to 100 per day. Some surveys may require hundreds to thousands of nodes. The onboard battery packs normally last long enough to accommodate any re-acquisition activities or other operational delays. At the conclusion of the survey the nodes are recovered in batches with ROVs and the data are downloaded on deck. The removal of the nodes is also a benefit of the system compared to the OBC approach because there are no leftover "obstacles" in the field that may impede future field development activities.

A study by SeaBird Exploration in 2008 (OTC-19691-PP) showed that, for a relatively small field size of 45km², the OBN technique is cost effective over the OBC approach if the survey period is less than 9 years in length. Limited CAPEX funding is necessary for the OBN technology since the nodes are re-used by the survey contractor.

A step-change in technology has also been proposed that would further reduce the cost of OBN operations. The use of



Courtesy of StatoilHydro

13th LoFS Survey on Valhall Field



WGP recently completed the thirteenth Life of Field Seismic (LoFS) survey over the Valhall field in the North Sea.

BP Norge AS, and operating partner Hess Norge AS, contracted WGP to provide the precisely positioned source sub-arrays necessary to maintain the high level of repeatability required for an effective Permanent Reservoir Monitoring (PRM) project. With the trenching of 120km of Ocean Bottom Cable (OBC), Valhall LoFS began in 2003 with an average of 2 surveys performed per year.

WGP installed Thalassa Energy Services' containerized seismic source system onto the PSV Stril Myster during a 6 day mobilization period in Stavanger. Thalassa's source system is the same design as used on all of the LoFS surveys since the project's inception and thus affords the required level of source repeatability.

The Valhall LoFS 14 survey is planned for Q3 2011.

self-positioning nodes would eliminate the need for an ROV and increase the rate of deployment. A gliding capability or a set of active thrusters could be used to position the node autonomously. The node would subsequently return to the surface for recovery without intervention. Navigation would be accomplished by traditional long-baseline technology as is currently done with the ROVs, or a set of key nodes could be assigned to be sentinels that would transmit their calibrated positions to their fellow nodes in the same manner as existing LBL transponders. Improvements in battery technology are currently underway that would permit this concept to be realized in the very near future.

Today's high-fidelity sensors, advanced computer processing power, and a better understanding of geophysics provide reservoir managers with the ability to rapidly and accurately visualize reservoir changes. This minimizes the risk of operations, increases production rates and provides for more efficient use of the earth's natural resources.

Lancer Systems, World-Class Fiber Optic Connectors, Engineered Plastics and Composites

Lancer Systems is a world-class team of engineering and manufacturing experts that are committed to providing unique solutions for harsh environment requirements. Lancer's optical engineers are extremely adept in connectivity solutions and apply cutting edge technology to solve the most challenging optical connectivity requirements.

When a system utilizes the total Lancer System of cable, connectors, adapters and feed-throughs our customers are assured the highest level of environmental protection and the most reliable data transmission available.

We leverage our extensive and diverse experience across various industries such as the energy market, to provide optimal sensor solutions for down-hole and subsea sensing applications, the military and defense market to satisfy mission critical requirements, and the subsea vehicle market in providing high performance penetrators for Unmanned Underwater Vehicles (UUV) as well as aerospace, communication, and other critical applications.



Lancer Systems, located in Allentown, Pennsylvania, was founded in 2007 by the ownership of Greene, Tweed and Company to develop unique and innovative products in the areas of fiber optic connector systems as well as engineered plastics and composites. Lancer's patented and proprietary connectors, adapters and feed-throughs ensure reliable connectivity in the harshest of environments.

Lancer's unique plastics capabilities provide lightweight solutions for equipment upgrades and new designs in a variety of industries. Our manufacturing capabilities include injection mold-

ing, compression molding, water jet cutting, and CNC machining.

Lancer is becoming well known for designing and manufacturing state of the art products through its own innovative ideas as well as providing new product development through partnering agreements with its customers. The company's leaders sought to improve Lancer's existing product line as well as to develop new items demanded by the industry through its research and development activities.

Lancer has the in-house capability to take an idea from the conceptual design phase to full production while optimizing cycle times, ensuring total quality control and enhancing operational efficiencies. Company-sponsored research and development efforts create a core of knowledge that leads to patented concepts and new products.

Developed for use in downhole drilling operations, Lancer's Fiber Optic Extreme is capable of withstanding operating pressures of 25,000 PSI and temperatures from -40 °C to +177 °C (350 °F). The Fiber Optic Extreme production technology provides superior customizable fiber optic connectors available in 1 to 12 channel configurations manufactured to exact specifications.

All designs can incorporate single mode and multi-mode fibers with minimal insertion loss and perform in the harshest of environments. The patented design of Fiber Optic Extreme can be manufactured in housings of Inconel 718, Hastelloy C-276, Stainless 625, or Stainless 17-4ph to fit specific application requirements.

When drilling equipment manufacturers wanted reliable measurement of well performance with minimal data loss, they turned to Lancer Systems for the optimum connector technology.

A six channel version of Fiber Optic Extreme is scheduled to be installed in a sensor system that will monitor the deformation of casing and sand screens in the well of a major oil company in the Gulf of Mexico.

The superior ruggedness of the Fiber Optic Extreme penetrator is detailed in the publication of a comprehensive test

HPHT Fiber Optic Penetrators



report that details the Environmental and Mechanical Testing conducted by an independent testing laboratory. This is a thorough report that details with graphs, pictures and datasheets the extensive testing of temperature cycling, salt fog, shock, vibration and pressure.

An electronic or print version of this test report is available by contacting Lancer Systems (http://www.lancer-systems.com/PDFs/Test_Report_SPN_112_10_Rev_B.pdf).

Lancer Systems has an innovative, forward-thinking philosophy that allows us to engineer and produce products that provide solutions and reliable performance for the most demanding conditions.

Customer satisfaction has been a high priority at Lancer since its founding. We never lose track of who we are serving and have always followed a well established tradition of providing quality products and service at competitive prices to our customers.

The outlook for the future of Lancer continues to be favorable as we continue to expand our existing product lines to enhance our product offering and provide opportunities to further service the demands of our customers on a global basis.

Permanent Bulkhead Feed-Throughs



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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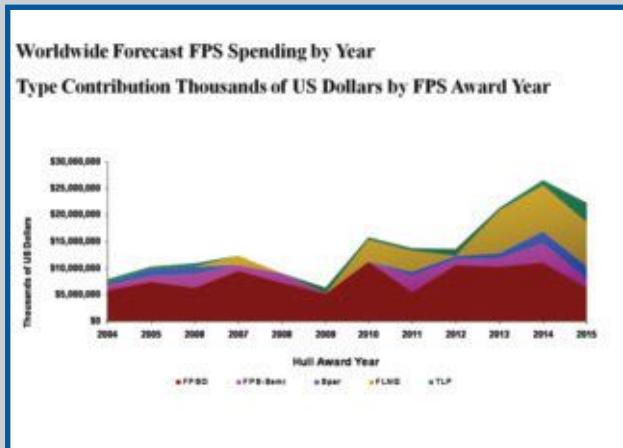
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Offshore At-A-Glance

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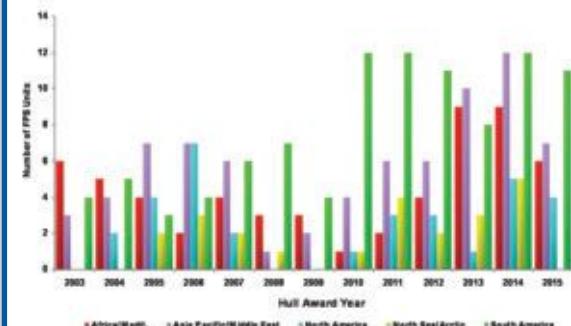
Worldwide Spending FPS Forecast



Worldwide FPS Awards

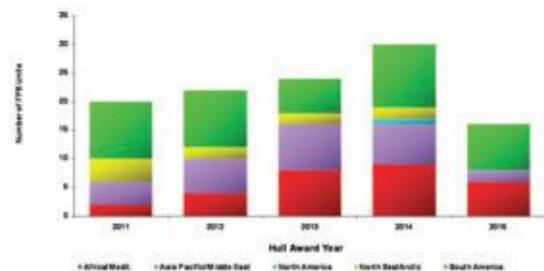
Worldwide FPS Awards 2003 (A) – 2015 (e)

Area Activity Share By Region



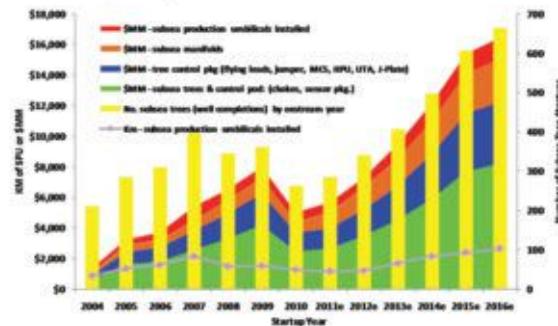
Worldwide FPSO Awards

World Wide FPSO Awards 2011 (e) – 2015 (e) Mean Case

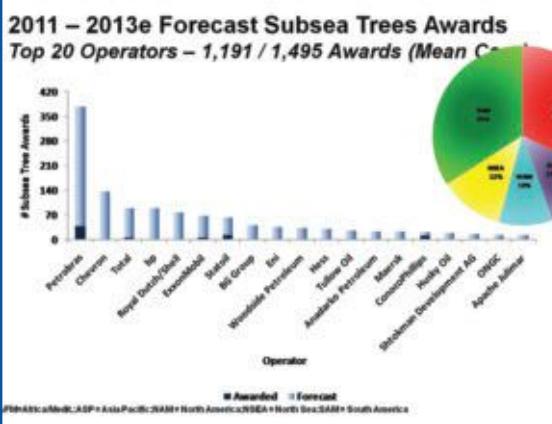


World Subsea Production Capex

World Subsea Production Capex Forecast spending 2011-2016e \$66.5bn

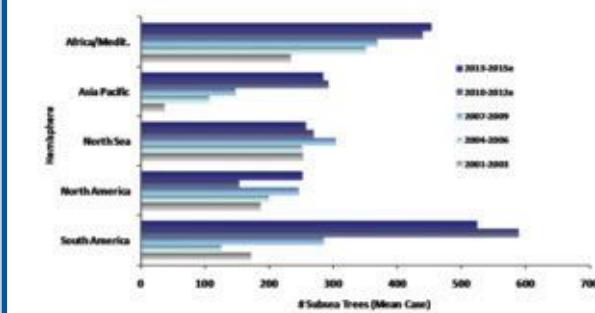


Forecast Subsea Tree Awards



Global Subsea Tree Awards

Global Subsea Tree Awards by Year 2001-2015e (Mean Case) 3-Year Buckets

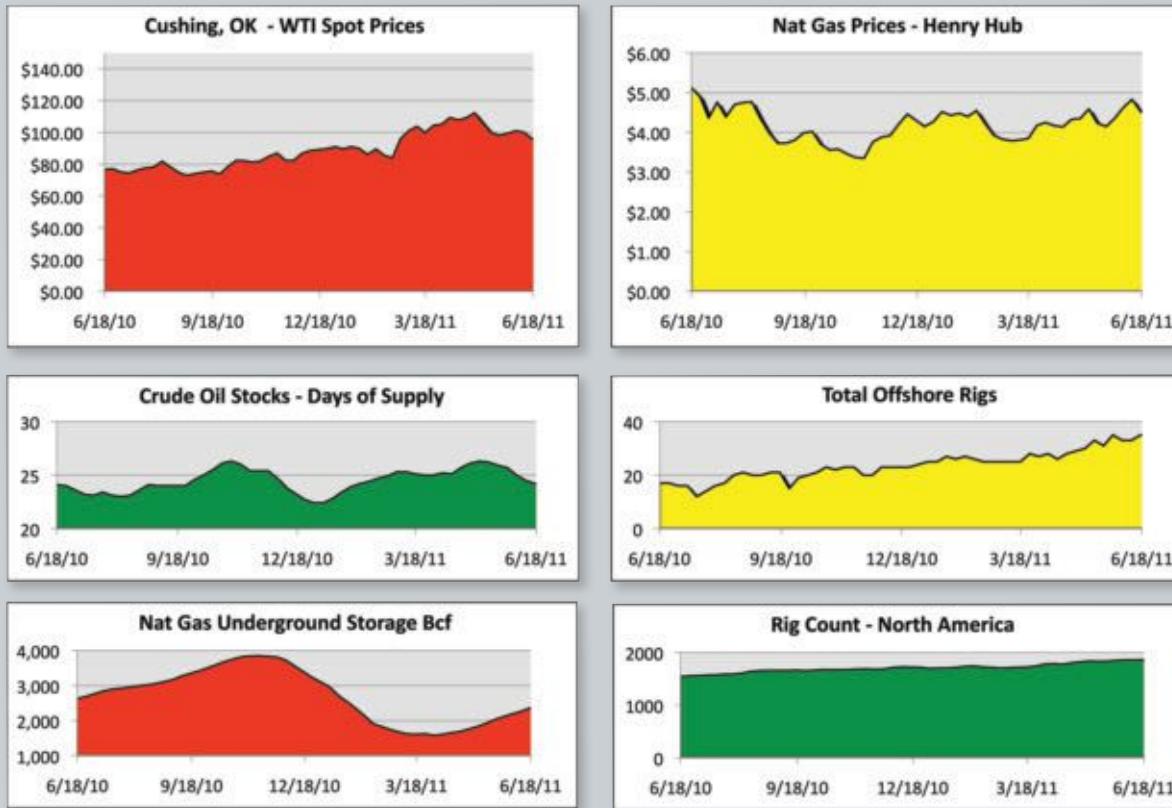


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Oil & Gas Industry Trends

Monitoring the pulse of the US Offshore Oil & Gas Industry



positive trend at least 3 weeks

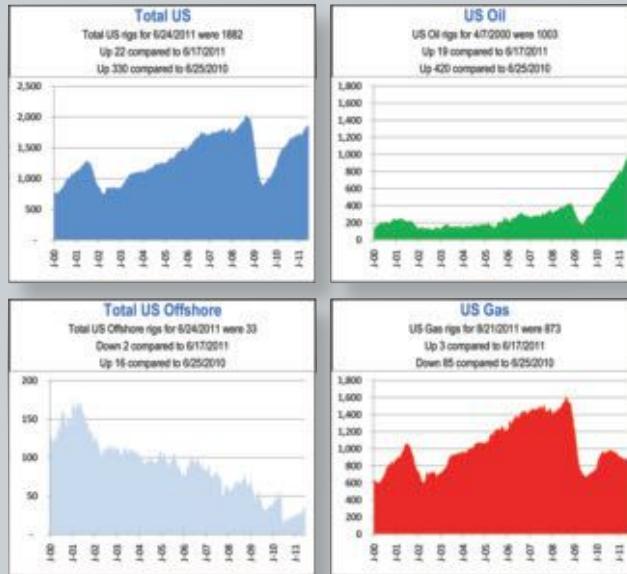
changing trend < 3 weeks

negative trend at least 3 weeks

Baker Hughes Rig Report

North American Rig Report June 24, 2011

Location	Week of 6/24	Week +/-	Week Ago	Year +/-	Year Ago
Land	1833	25	1808	311	1522
Inland Waters	16	-1	17	3	13
Offshore	33	-2	35	16	17
U.S. Total	1882	22	1860	330	1552
Gulf of Mexico	33	-2	35	16	17
Canada	250	-27	277	-23	273
N. America	2132	-5	2137	307	1825



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
Anadarko Petroleum Corp.	DC 620	G23528	ENSCO 8500	Spiderman	8,055
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
ExxonMobil Corp.	KC 919	G21447	MAERSK DEVELOPER	Hadrian	6,941
Chevron USA Inc.	KC 736	G22367	T.O. DISCOVERER INSPIRATION	Moccasin	6,750
Chevron USA Inc.	KC 785	G25806	T.O. DISCOVERER DEEP SEAS		6,590
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
Shell Offshore Inc.	MC 687	G05862	T.O. DEEPWATER NAUTILUS	Mensa	5,292
BHP Billiton Petroleum (GOM)	GC 654	G20085	T.O. DEVELOPMENT DRILLER I	Shenzi	4,383
Chevron USA Inc.	GC 640	G20082	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	CAL DIVE-4000	Princess	3,853
Shell Offshore Inc.	MC 516	G11528	H&P 204	Princess	3,800
Murphy E&P Co.	GC 338	G21790	NABORS MODS 200	Front Runner	3,325
Marathon Oil Co.	GB 515	G20792	DIIAMOND OCEAN MONARCH	Ozona	3,287
ATP Oil & Gas Corp.	MC 711	G14016	DIAMOND OCEAN VICTORY	Gomez	2,951
Shell Offshore Inc.	MC 807	G07963	H&P 201	Mars b	2,945
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
Walter Oil & Gas Corp.	GB 302	G24479	DIAMOND OCEAN SARATOGA		2,410
Chevron USA Inc.	VK 786	G10944	NABORS 87	Petronius	1,754
LLOG Exploration Offshore, LLC	MC 751	G33175	NOBLE AMOS RUNNER	Goose	1,624
Stone Energy Corp.	MC 109	G05825	H&P 206	Amberjack	1,030

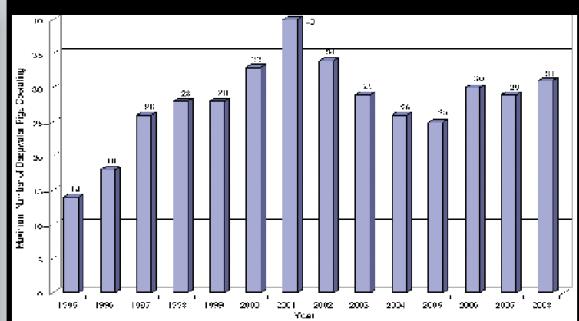
Deepwater prospects with drilling and workover activity: 26

Current Deepwater Activity as of Monday, June 20, 2011

Activity by Water Depth

Water Depth in Meters	Active Leases	Approved Applications	Active
0 to 200	2,024	33,800	3,223
201 to 400	133	1,110	20
401 to 800	304	834	10
801 to 1,000	395	509	7
1,000 & above	3,311	1,649	26

Rig activity by year



Activity by water depth Information current as of Monday, June 20, 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



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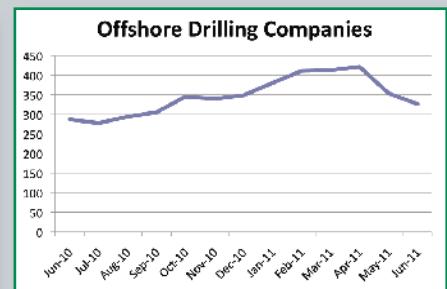
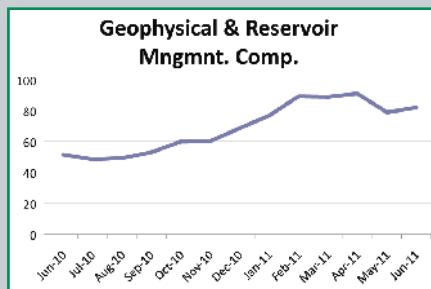
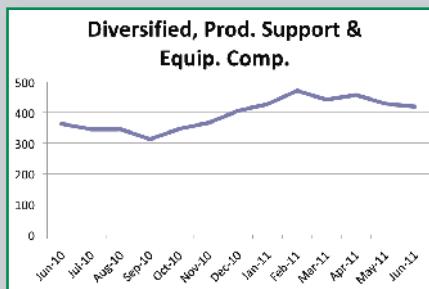
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Monthly Stock Figures & Composite Index

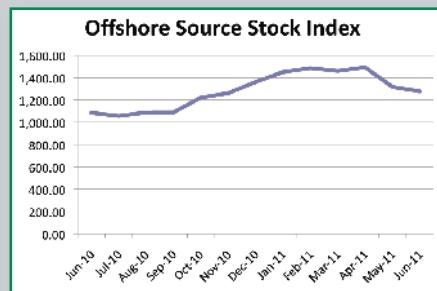
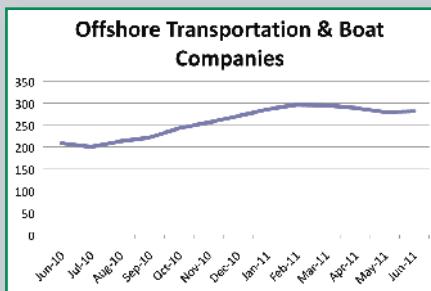


Industry Company Name	Symbol	Close Mid-May	Close Mid-April	Change	Change %	High 52 week	Low
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	70.93	71.04	-0.11	-0.2%	79.24	36.76
Cameron Intl. Corp.	CAM	46.78	48.01	-1.23	-2.6%	63.16	31.42
Drill-Quip, Inc.	DRQ	64.54	68.83	-4.29	-6.2%	83.80	42.35
Halliburton Company	HAL	47.05	47.05	0.00	0.0%	51.45	24.26
Tenaris SA	TS	44.85	47.61	-2.76	-5.8%	51.07	32.91
Newpark Resources, Inc.	NR	8.67	8.82	-0.15	-1.7%	10.00	5.12
Schlumberger Ltd.	SLB	83.93	83.61	0.32	0.4%	95.64	52.91
Superior Energy Services, Inc.	SPN	35.25	34.29	0.96	2.8%	41.65	18.02
Weatherford International, Inc.	WFT	17.41	19.38	-1.97	-10.2%	26.25	12.68
Deep Down, Inc.	DPDW	0.08	0.11	(0.03)	0.0%	0.29	0.05
Total Diversified, Production, Support and Equipment.....		419.49	428.75	-9.26	-2.2%	502.55	256.48
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	31.88	32.54	-0.66	-2.0%	50.81	20.05
Mitcham Industries, Inc.	MIND	14.75	13.58	1.17	8.6%	17.22	5.98
Compagnie Gnrale de Gophysique-Veritas	CGV	35.47	32.88	2.59	7.9%	38.12	16.42
Total Geophysical / Reservoir Management.....		82.10	79.00	3.10	3.9%	106.15	42.45
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	40.43	45.49	-5.06	-11.1%	46.92	23.75
Diamond Offshore Drilling, Inc.	DO	67.54	72.47	-4.93	-6.8%	81.19	57.76
ENSCO International, Inc.	ESV	51.90	55.76	-3.86	-6.9%	60.31	37.39
Nabors Industries, Inc.	NBR	23.65	26.60	-2.95	-11.1%	32.47	15.54
Noble Drilling Corp.	NE	38.23	40.48	-2.25	-5.6%	46.72	28.21
Parker Drilling Company	PKD	5.88	5.72	0.16	2.8%	7.45	3.43
Rowan Companies, Inc.	RDC	36.52	38.95	-2.43	-6.2%	44.83	20.44
Transocean Offshore, Inc.	RIG	61.78	67.92	-6.14	-9.0%	85.98	44.30
Total Offshore Drilling.....		325.93	353.39	-27.46	-7.8%	405.87	230.82

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	16.20	15.79	0.41	2.6%	19.20	8.38
Gulf Island Fabrication	GIFI	29.43	28.29	1.14	4.0%	35.85	14.47
Global Industries, Ltd.	GLBL	5.28	6.09	-0.81	-13.3%	10.23	4.05
McDermott International, Inc.	MDR	18.60	21.15	-2.55	-12.1%	26.14	12.10
Oceaneering International	OII	37.54	40.64	-3.10	-7.6%	46.19	21.55
Subsea 7 SA	SUBCY.PK	24.20	25.00	-0.80	-3.2%	26.68	14.11
Technip ADS	TKPPY.PK	26.05	25.05	1.00	4.0%	28.35	14.16
Tetra Technologies, Inc.	TTI	12.31	14.18	-1.87	-13.2%	16.00	8.00
Total Offshore Contractors, Service and Support.....	169.61	176.19	-6.58	-3.7%	208.64	96.82	
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	95.54	96.04	-0.50	-0.5%	116.00	68.39
Gulfmark Offshore, Inc.	GLF	40.18	39.44	0.74	1.9%	47.31	25.24
Bristow Group	BRS	45.61	42.51	3.10	7.3%	52.39	28.32
PHI, Inc.	PHII	21.52	20.00	1.52	7.6%	23.55	13.15
Tidewater, Inc.	TDW	51.92	56.26	-4.34	-7.7%	63.55	37.99
Trico Marine Services, Inc.	TRMAQ.PK	0.08	0.07	0.01	14.3%	1.07	0.03
Hornbeck Offshore	HOS	26.49	25.28	1.21	4.8%	31.77	14.13
Total Offshore Transportation and Boat	281.34	279.60	1.74	0.6%	335.64	187.25	
Total Diversified, Production, Support and Equipment	419.49	428.75	-9.26	-2.2%	502.55	256.48	
Total Geophysical / Reservoir Management	82.10	79.00	3.10	3.9%	106.15	42.45	
Total Offshore Drilling	325.93	353.39	-27.46	-7.8%	405.87	230.82	
Total Offshore Contractors, Service and Support	169.61	176.19	-6.58	-3.7%	208.64	96.82	
Total Offshore Transportation and Boat	281.34	279.60	1.74	0.6%	335.64	187.25	
Total Offshore Source Index...	1,278.47	1,316.93	-38.46	-2.9%	1,558.85	813.82	

Cathelco and UMC use specialized techniques on Liev Eriksson installation

Cathelco has worked in collaboration with UMC International to install a hull corrosion protection system on "Liev Eriksson", a semi-submersible drilling rig, as part of its class renewal program.

The ICCP equipment was supplied by Cathelco, while UMC acted as the prime contractor for a team of technicians drawn from eight different companies.

The Leiv Eriksson, was built in 2001 and is operated by Ocean Rig AS of Norway. It recently completed drilling operations in the Black Sea and was refitted in Turkey before continuing to its next contract in the Western Atlantic.

The vessel's two pontoons were installed with a Cathelco impressed current cathodic protection (ICCP) system. This consisted of a 900amp 24-volt thyristor control panel wired to six anodes and two reference electrodes.

"The work was carried out to a tight schedule while the vessel was afloat and, therefore, we worked in partnership with UMC International to devise special components and diving techniques to facilitate the installation," said Steve Ellis, project development manager at Cathelco Ltd.

In the case of a normal drydock installation, holes would be cut in the pontoons to accept cofferdams, which would be welded in position. The anodes and reference electrodes would be mounted in the cofferdams and a di-electric shield would be applied to the surrounding hull surface.

"Our approach to the Leiv Eriksson project had to be entirely different and involved some innovative methods", Steve Ellis commented.

The cofferdams to house the anodes and reference electrodes were attached to sections of steel that were of the same grade and thickness as the original hull material.

Prior to the installation, UMC divers created a temporary cofferdam on the exterior of the hull and removed a section of plate. The new section, with the cofferdam to house the anodes and electrodes, was then welded into position.

The next step was for divers working on the outside of



the vessel to fit the anodes and reference electrodes. Finally, a di-electric shield made from PVC was placed around the anode and sealed into position.

"The project involved a considerable amount of planning to ensure that there was access for the pre-mounted cofferdams as well as designing the most efficient cable runs and co-ordinating the work to meet the deadline for completion", Steve Ellis explained.

The 'Leiv Eriksson' contract is the latest in a series of projects to be jointly undertaken by Cathelco and UMC International who created an alliance in 2009, enabling the specialist diving services of UMC to be used for the installation and maintenance of corrosion protection systems supplied by Cathelco.

Cathelco are world leaders in marine pipework anti-fouling systems and hull corrosion protection systems for ships and offshore structures, with a record of 30,000 installations over a period of more than 50 years.

UMC International, a member of the V.Group, is a worldwide supplier of underwater engineering and maintenance services and products to commercial, naval, and offshore vessels and platforms.

For more information, visit www.cathelco.com.

New dual backscatter/sidescatter turbidity probe with antifouling features



Campbell Scientific is pleased to announce the new OBS500 Dual Turbidity Probe with Antifouling. The new probe combines a backscatter sensor (better at measuring high turbidity) with a second sidescatter sensor (better at measuring lower turbidity) and multiple antifouling methods to provide accurate measurements in biologically active water.

The OBS500 incorporates the CleanSensor™ Antifouling Method (patent pending) to ensure the accuracy of its measurements. The CleanSensor™ method uses a shutter/wiper mechanism to protect and clean the optics.

This antifouling method also includes a chamber filled with a biocide that continuously leaches out over the optics while the probe is in the closed position. It is the first within the industry to incorporate a shutter, wiper, and biocide combination into one unit. A disposable plastic sleeve is offered, which can make clean up a snap, as well as an optional copper sleeve that can provide additional protection, especially in sea water.

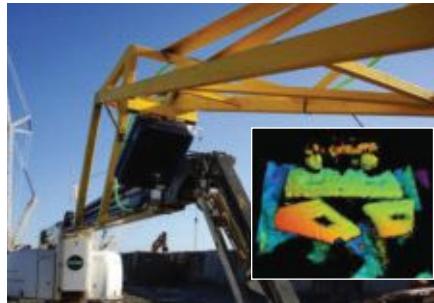
For more information about the OBS500, visit www.campbellsci.com/obs500.

CodaOctopus reports Echoscope® success with a major construction company in Spain

UTE Langosteira is a consortium of companies involved in one of the largest port expansion projects currently being undertaken. The project, situated on the north west coast of Spain, consists of forming a 240 Hectare deepwater shipping basin protected by a manmade breakwater running for almost 3.5km across the bay. Detailed civil engineering works have been carried out to ensure this advanced breakwater will withstand the forces of the large Atlantic swells that periodically strike this area.

On the seaward side, the breakwater is being formed using 150 tonne concrete armouring blocks. On the inward side, it's designed to have thousands of 52 tonne rectangular concrete blocks placed in a wall-like arrangement to a depth of about 14m. Placing these blocks underwater was a great challenge which the engineers met by turning to CodaOctopus and the Echoscope 3D real-time (i.e., 4D, high-definition multibeam sonar).

During the recent Ports and Coasts seminar held in Las Palmas, Mr. Jose



Enrique Pérez Noguer, UTE Langosteira's General Manager, presented results of their successful use of the Echoscope 4D sonar. The audience heard that since testing and subsequently purchasing the system, their productivity and accuracy for block placement has almost tripled. More importantly, due to the now infrequent use of divers to check alignment, there have been no reported safety issues.

"We had a real problem to precisely place these concrete blocks in zero visibility. After evaluating several sensors, the only choice suitable for our crane operators was the Echoscope 4D sonar." Mr. Enrique further noted, "Not only did it greatly improve our productivity, it enhanced our safety record due to substantially less underwater intervention by divers."

For more information, visit www.codaoctopus.com.

OceanSENSE leak detector delivers 100% detection record In North Sea

A leak detector engineered by OceanTools has delivered a 100% detection record across a recent series of major North Sea projects. The OceanSENSE-DH diver held leak detector, which was launched by OceanTools in late 2010, offers detection capabilities up to 50 times more effective than traditional 'black light' systems.



OceanSENSE is compact and lightweight and can be operated by an ROV team, meaning that no additional personnel are required. The compact design allows the units to be mounted on a wide

continued next page

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range of ROVs. As the system uses high intensity light emitting diodes (LEDs) for excitation of the fluorescence, there are no safety issues as may be found with older, less efficient, laser-based leak detection systems. The OceanSENSE units can be configured to detect any combination of fluorescing materials, including fluorescein, rhodamine, hydrocarbons, hydraulic fluids (with certain added tracers), and chlorophyll. The OceanTools development team has also been producing variants on OceanSENSE, including OceanSENSE-Micro, an ultra compact version; OceanSENSE-Pelagic, a Pelagic 100 detecting version; and OceanSENSE-AUV, an AUV-mounted version. OceanSENSE units are available for sale or rental.

For more information, visit www.ocean tools.eu.

Seanic's ROV-mounted ECB pump

Seanic Ocean Systems has developed a unique subsea water blasting system (ECB) that incorporates cavitation technology capable of being used with most work class ROVs.



The ECB pump was built to solve an industry-wide problem, where traditional 5K pressure washers are extremely inefficient for cleaning heavy marine growth and 10K pressure washers could potentially damage sensitive materials such as rubber, paint, or anti-fouling coatings. The ECB pump is extremely efficient and powerful in the removal of marine growth from vessel hulls, strakes, risers, fairings, and moorings, saving operators time and money.

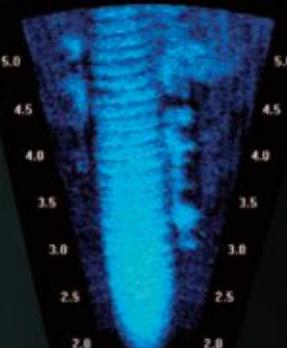
Andy Guinn, VP of operations, said, "We have been consistently satisfied with the performance of the pumps. To date, our fleet of models are being used on diverse cleaning campaigns throughout the GoM. I am also excited to report that our rental partner, Ashtead Technology, has several units working in SEA/Australia, as a result of the success in the GoM."

For more information, visit www.sean icusa.com.

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(Data courtesy of Oceaneering)



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International Industries gets USACE orders

International Industries Inc. and EdgeTech Marine have taken orders for Model 4125 side scan sonars this month from two U.S. Army Corps of Engineers Districts. The Seattle, Washington District and the Norfolk, Virginia District have both determined that the Model 4125 is just what they need and have ordered them for delivery. These systems are a new wave of expertise into the USACE Hydrographic efforts for high-frequency, shallow water. The EdgeTech side scan sonars provide a unique advantage over the conventional, heavy weight, deep side scan sonar by combining EdgeTech's very high frequency with simultaneous dual frequency recording technologies into a very lightweight unit.

EdgeTech engineering has produced many new side scan sonars of late, including the 4125 (400/1250 kHz) low-cost, digital telemetry system for harbor security and search and rescue (SAR) and the 4700-DFX Focused Multi-pulse side scan sonar.

For more information, visit www.internationalindustries.net.

Sonardyne Ranger 2 systems sold to Ashtead in Asia

Two Sonardyne Ranger 2 USBL (Ultra-Short BaseLine) acoustic positioning systems have been purchased by rental company Ashtead Technology in Singapore as part of a multi-million pound investment program in the latest subsea technology. Ashtead Technology has chosen the high-specification Ranger 2 Pro variant and complementary Wideband Mini Transponders, which are now available to rent in Asia for the first time.

Ranger 2 is designed for deepwater, long-range tracking of underwater targets, such as ROVs, and position referencing for dynamically positioned (DP) vessels. The new version builds on



the simplicity and performance of Sonardyne's original Ranger system by adding support for the company's latest sixth generation (6G®) acoustic instruments, Wideband 2 signal architecture and Lodestar inertial navigation sensors. These technologies enable multiple subsea targets to be positioned with survey-grade accuracy in any water depth while reducing operational time and vessel costs.

Wärtsilä, Versa Power agree to jointly develop solid oxide fuel cell technology in commercial applications

Wärtsilä and Versa Power Systems (VPS), a leading developer of environmentally friendly, high-power solid oxide fuel cells (SOFC), announced a co-operative agreement to develop and integrate Versa Power's SOFC technology into Wärtsilä products.

A key target of the agreement is to develop commercial Wärtsilä fuel cell products that generate power and heat for various applications in the distributed energy and marine markets. The agreement allows Wärtsilä to integrate VPS fuel cell stack modules, especially for larger power range products. For VPS, the agreement provides a dedicated partner with the ability to commercialize fuel cell products in large markets around the globe.

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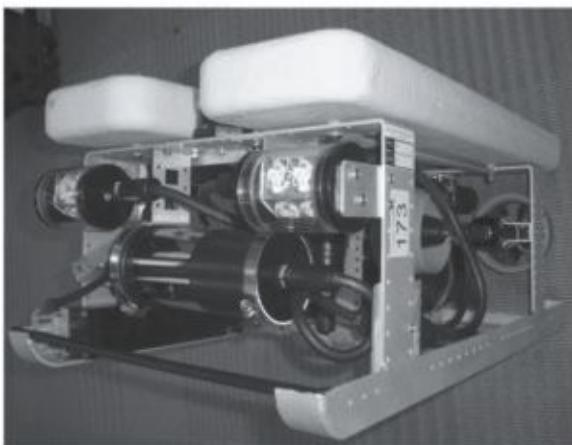
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Product News

New Cygnus ROV-Mountable Thickness Gauges

Cygnus Instruments launched a new range of ROV-mountable thickness gauges. The new gauges are designed to work at greater depths and streamline the measurement process. With two new models pressure rated to 2,000m and 4000m, the gauges break new ground with optional on-screen video overlay of thickness measurements, allowing ROV pilots to guide the ROV while viewing measurements simultaneously. It is also the first Cygnus device to offer user selectable output data in both RS-422 and RS-232 without the need for a converter for use with multi-plexers.



The standard system will continue to be supplied with Cygnus' standard Windows-based software, CygLink, for independent monitoring, recording or logging of thickness measurements.

With functionality a priority, these latest units provide a switchable deep coat mode for measuring through coatings 20mm thick, a removable cover plate for full serviceability, and industry standard wet mateable "MC" style underwater connectors. There is also a safety pressure relief valve and securing eye for added security.

For more information, visit www.cygnusinstruments.com.

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Advanced wide angle version of Kongsberg OE14-502 HD Camera

Underwater camera specialist, Kongsberg Maritime, has introduced the OE14-502-WA with wide angle lens option to its market-leading camera and imaging sonar portfolio. This new version of the OE14-502 HD camera has been developed in direct response to increased customer demand for a wide angled high-definition underwater video camera for use in harsh environments for many applications including pipe surveys.

The affordable OE14-502-WA HD camera with wide angle lens option offers an angle of view as wide as 70° in water, while retaining superb image and color quality all without optical aberrations often associated with wide angle viewing. This represents a 20° increase to the diagonal viewing angle when compared to the standard 50° version of the OE14-502.

The OE14-502 is a rugged multi-standard ROV HD video camera used for a range of detailed ROV inspection and intervention tasks, including manipulator work and pipeline inspections. It offers 800 TV lines per picture height horizontal resolution, 10x optical zoom, 4,500m depth rating, and has multi-standard video capability with the ability to change video formats by using Remote Control (RC) or by Graphical User Interface (GUI).



Long line cable drive can be set by RC or GUI and allows the component signal to drive three matched coax cables with no degradation over 200m. Color balance can also be set to 3,200k, 6,500k, outdoor or Auto Tracking White (ATW) to match different lighting set-ups.

The unique Kongsberg maritime IR Remote Control also allows camera control configuration. Camera control can be single wire (tri-state), two wire (bi-polar), USB RS232, and RS485.

Key product features

- Pixel resolution 1920 x 1080
- High definition (measured 800 TV lines per picture height)
- 10:1 optical zoom lens
- 50° or 70° diagonal angle of view (in water)
- Exceptional dynamic light range
- Multi-standard video formats (1080i or 720P 50/60 Hz, composite PAL or NTSC)
- HD-SDI out coax or fiber connector options
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- High levels of temperature, humidity, shock, vibration, over voltage, and electromagnetic compatibility protection.

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

UTEC Survey takes delivery of Ronson CPT

UTEC has taken delivery of a deep-push seabed Cone Penetration Testing (CPT) unit to support its Asia Pacific, Middle East, and Australian geotechnical operations.

Manufactured by Netherlands-based A.P. van den Berg, the Roson CPT unit includes a recently upgraded 75kN twin-drive thrust for deeper seabed soil investigations. Offshore applications will include pre-installation analysis for oil and gas construction, civil works, subsea telecommunications, and renewable energy infrastructures in both shallow and deep water environments.



The twin wheel drive seabed CPT system uses *in situ* piezocone CPT testing with cones from 5 to 15cm², including T-bar and dissipation tests, for penetration to depths of 40m below seabed in suitable conditions.

The weight of the system can be customized with modular ballast plates to achieve a specific reaction force and penetration depth. The deployment system includes a self-tensioning umbilical winch to accommodate power and signal telemetry. The acquired CPT data is uplinked in real-time via cable to a surface recording and data processing unit. All geotechnical testing is carried out in full accordance with international specifications and standards (ISO, ASTM and NGI) for *in situ* testing.

For more information, visit www.utecsurvey.com.

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People & Company News

BIRNS, Inc., has appointed **Steve Bell** as its new Optical/Photonics Engineer. In his new position, Bell will be responsible for the design, development, and execution of the company's diverse fiber-optic connector systems. He will continue to help BIRNS expand and enhance its wide range of popular fiber optic and hybrid connector solutions, including the new BIRNS Millennium™ standard electro-optical hybrid series.



Bell

Knight Oil Tools named **Matthew Scott** corporate account representative. Scott has more than 30 years of oilfield sales experience. He has held various sales management positions at Reed Hycalog, and his most recent position was senior account representative for Halliburton.

Samson Oil & Gas Ltd. said board Chairman **Neil MacLachlan** intended to retire effective 30 June 2011. MacLachlan has served on Samson's board of directors since 1998 and was elected chairman in 2007. Upon MacLachlan's departure,

Victor Rudenno was to assume the position of chairman. The board already has initiated a process to identify candidates to serve on an expanded Samson board.

Transocean's board of directors elected **J. Michael Talbert** chairman of the board of directors, replacing **Robert E. Rose**, who retired following the 2011 annual general meeting. Transocean also announced the election of **Jagjeet S. Bindra** and **Steve Lucas** as Class III directors, each for a three-year term; the election of **Tan Ek Kia** as a Class I director for a one year term; and the re-election of **Martin B. McNamara** and **Ian C. Strachan** as Class III directors, each for a three year term.

Network specialist Ciena® Corp. appointed industry veteran **Ed McCormack** vice president and general manager of international accounts and submarine systems. In this role, he will be responsible for strategic partnerships, business development and customer support for Ciena's submarine business. He will be based out of Ciena's Abu Dhabi office in the United Arab Emirates, further strengthening the company's commitment to one of the fastest growing regions in the global submarine network.

ing market.

CA Richards & Assoc., Inc. has announced that **Rick Cisneros** joined the firm in May 2011. Cisneros will be covering accounts in Texas, Louisiana and Mississippi. His experience includes DP reference systems, acoustic positioning, imaging sonar systems, SVDR installations and ROV sensor integrations.



Cisneros

Pacnet appointed **Sunanda Das** managing director of Pacnet India, with responsibility for management and strategic development of the company's business in India. Based in Bangalore, Das joins Pacnet from Cable and Wireless, where he was managing director and oversaw business in India and SAARC, as well as provided strategic guidance to offshore operational support from India.

Aker Solutions in the UK has strengthened its position in the subsea sector with the appointment of **Harry Kulasinghe** as the new vice president of business development to steer the division as it enters a new period of growth.



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- Dr. Marcia McNutt, Director, U.S. Geological Survey
- Mr. Mike Utsler, COO, Gulf Coast Restoration Organization, BP
- Dr. Eddie Bernard, Former Director, NOAA PMEL

Technical Program - OCEANS '11 MTS/IEEE Kona will have a very strong technical program. A record 750+ abstracts were received with substantial international representation and a broad range of topics.

Exhibits - Over 100 national and international exhibitors from government, academia, and industry have already committed. Please contact our Exhibits team at exhibit@oceans11mtsieekona.org to reserve your space.

Tutorials - Nine offerings for full- and half-day sessions on a wide variety of technical topics.

Education Symposium - Sat Sept 17, 2011, Hilton Waikoloa Village - Free full- & half-day professional development offerings for elementary to high school educators.

Exclusive Tours - A tour of the Natural Energy Laboratory of Hawai'i Authority (NELHA), the state's most unique and innovative ocean science and technology development park.

Patron Opportunities - Several are still available to enhance your market visibility!

Important Dates

- Final Submission of Papers: 15 July
 - Early Bird Rooms & Registration: 01 Aug
 - NELHA Tours sign-up: 15 Aug
 - Education Symposium sign-up: 26 Aug
 - Conference dates: 19-22 Sept 2011
- www.oceans11mtsieekona.org



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and expansion. Kulasinghe will lead the business development and contracts and tendering departments of the engineering construction services firm's subsea business unit as it looks to recruit an additional 550 workers and planned investment in research and development over the next three years.

CSA International, Inc. (CSA) has announced that **Dr. Cindy Chandool** has recently joined its branch office in Trinidad and Tobago. This office was opened in 2006 to better facilitate in-country and regional projects by providing both a technical and administrative base for operations. Dr. Chandool holds a Ph.D. from the University of Florida, with specialization in interdisciplinary ecology and environmental engineering sciences. She has a background in natural resource and environmental management, in particular regulatory environmental enforcement, environmental impact assessment and environmental research. TGS appointed **Rod Starr** senior vice president Africa, Middle East and Asia Pacific. Starr has been with TGS for more than 10 years and has held a variety of leadership positions in both the geophysical and geological businesses. Most recently Starr held the position of general manager, Asia Pacific and was based in Perth, Australia. He will begin this new role immediately and report directly to the Chief Executive Officer Robert Hobbs. The position will be based in Houston, Texas.

MicroSeismic, Inc. (MSI), a geophysical service company providing 3D passive seismic imaging for energy exploration and production, said that **Terry Jbeili** joined the company as its executive vice president of operations. Jbeili brings more than 30 years of experience in the exploration, development and production sectors of the petroleum industry, with more than half spent abroad focusing on international operations in areas such as Europe, the North Sea, the Arabian Gulf, the Former Soviet Union and North Africa.

Fugro Multi Client Services named **Tim Addington** chief geophysicist, said Sverre Berstad, exploration manager for East Africa, Middle East and Russia. Fugro Multi Client Services provides high definition, non-exclusive 2D and 3D seismic data from most of the prolific oil and gas basins in the world – data that can be interpreted over large basin-wide areas. Addington will provide geophysical support for the Americas, including seismic data processing and quality control for Fugro Multi-Client Services in both North and South America.

Noble Corp. said **Lee M. Ahlstrom** was named to the position of senior vice president, strategic development. Ahlstrom will be responsible for evaluating and developing strategic alternatives and initiatives to guide the company's path toward increasing shareholder value into the future. He will report to David W. Williams, chairman, president and chief executive officer. Ahlstrom joined the company in May 2006 and has served as vice president of investor relations and planning since that time.

Dr. James Kendall was appointed director of the Alaska Outer Continental Shelf (OCS) Region for the federal Bureau of Ocean Energy Management, Regulation and Enforcement, BOEMRE Director Michael R. Bromwich announced. Kendall has been serving as the acting director for the region since 1 January 2011. Kendall served as the chief of the environmental sciences section of BOEMRE's Gulf of Mexico Region. Kendall will eventually transition to become the head of the Alaska region for the Bureau of Ocean Energy Management, one of the new agencies that will replace the former Minerals



Chandool

Management Service on 1 October 2011. BOEMRE's Alaska Region oversees the exploration and development of oil and gas resources in federal waters offshore Alaska. This includes assessments of the oil and gas resources.

Globe Wireless is very pleased to announce that **David Kagan** will be joining the Company as President effective June 20, 2011. Kagan comes to Globe Wireless from SpaceNet, where he was Senior Vice President of Business Development. Prior to his work at SpaceNet, he spent 11 years as President & CEO of Maritime Telecommunications Network (MTN) in Miramar, Florida. Mr. Kagan will work alongside Ken Jones, Chairman of Globe Wireless in the overall management and strategic development of the Company.

Subsea services group **Acteon** has acquired Aberdeen-based **NCS Survey Limited**. The acquisition adds to Acteon's capability in the rig-positioning market and provides an additional suite of survey services to clients that operate rigs and vessels. NCS Survey provides high-precision rig-positioning, construction-support and subsea-visualisation services to the global offshore market, including upstream oil and gas and offshore wind. NCS Survey Ltd, also announced the appointment of **John Meaden** as chief operating officer reporting to Andy Gray, president. John will assist NCS Survey with the next stage of its growth following its recent acquisition by Acteon Group Ltd.

iXBlue has expanded its customer support function with the appointment of **Scott Gray** based in Aberdeen, UK. In his role as customer support engineer, Gray will assist customers in the UK and Ireland across all the company's product areas. He will provide technical support and product demonstrations and offer training at the Aberdeen facility and customers' locations.

Hiring Now

BlueView Technologies, Inc. the world leader in compact acoustic imaging and measurement technology is currently seeking candidates for the following full-time position:

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Calendar

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

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

September 18-23, 2011:
SEG International Exposition
San Antonio, TX
www.seg.org

September 19-22, 2011:
Oceans 2011
Kona, Hawaii
www.oceans11mtsieekona.org

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

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

October 11-12, 2011:
MTS Dynamic Positioning
Houston, TX
www.mtsociety.org

October 11-13, 2011:
AWEA Offshore Windpower 2011
Baltimore, MD
www.offshorewindexpo.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

Nov. 30 - Dec 1, 2011:
Clean Gulf
San Antonio, TX
www.cleangulf.org

Nov. 30 - Dec. 2, 2011:
International Workboat
New Orleans, LA
www.workboatshow.com

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

March 13-15, 2012:
Oceanology 2012
London, UK
www.oceanologyinternational.com



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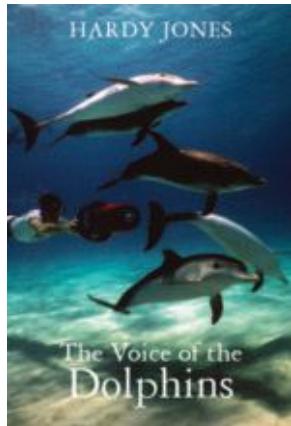
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The Voice of the Dolphins

In "The Voice of the Dolphins" ocean conservationist Hardy Jones aims to reveal intimate details of dolphins in the wild and the emerging threats to their very existence. Jones, a wildlife conservationist and filmmaker, has a connection to dolphins he could never have imagined when he first ventured into their realm more than thirty years ago. In "The Voice of the Dolphins," Jones tells of fascinating and inspirational discoveries made while studying dolphins in the wild. He then turns to his campaign to stop the slaughter of dolphins in Japan. However, the author argues that an even greater lethal threat to dolphins--and, it turns out, to humans--is the rising level of contaminants in the ocean food chain. Jones

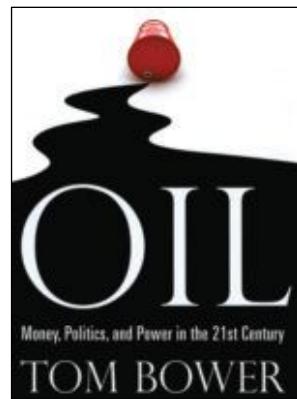
stands as living proof of the danger mankind faces. He was diagnosed with multiple myeloma, a form of blood cancer associated with chemical toxins. Blood tests revealed he had highly elevated levels of chemicals such as DDT, flame retardants and hexachlorobenzene in his blood and tissues--the same chemicals found in ever-greater concentrations throughout dolphin populations around the world. The diagnosis spurred him to seek the sources of the pollutants in his own body and to document their impact on marine life and human beings. Jones has found dolphins with multiple myeloma, and his research reveals extreme levels of contamination in those dolphins tested. Dolphins, Jones argues, are sentinels of the health of the oceans; if that is so, the warning they are sending is dire indeed. Dolphins around the world are being diagnosed with rising levels of disease--diseases that were unknown in these creatures until recently. Jones hopes that readers will realize how much humans and dolphins depend on healthy oceans, and how seriously we are damaging them.

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

Part of the BIRNS Group, Birns Aquamate LLC design and manufacture underwater electrical connectors, cable assemblies, and cable terminations. The company produces a wide range of standard industry connectors such as the 5500 Series, SC, MC, LP, FAWL/FAWM, Rubber Molded, etc. fully compatible with other manufacturers. Birns also specializes in fast turn-around for custom design of special connector solutions. Stocking dealers in the UK (Scorpion Oceanics) South Africa (Marine Solutions) Holland (Nautikaris and Seascape) and Brazil (MAKO).



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 Contact: Mike Stewart

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iXSea is part of the iXBlue group, built around companies, well known for their continuous innovation. iXBlue is able to combine its unique technologies, products, systems and services from across its subsidiaries to provide the kind of solutions that cannot be found anywhere else in the industry.

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Teledyne TSS Ltd.

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 Contact: Carolyn Jones
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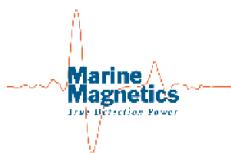
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E-mail: sales@geometrics.com
Website: www.geometrics.com
Contact: Ross Johnson

Geometrics, a member of OYO Corporation, manufactures, sells, and services portable geophysical instruments for land, marine, and air investigations of the subsurface. Geometrics' product line includes proton precession and cesium magnetometers, high-resolution seismographs, and electrical conductivity imaging and resistivity systems. Geometrics' instruments are used around the world for natural resource exploration, geotechnical and environmental assessments, ordnance detection, locating archeological and treasure sites, teaching and research.



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Contact: Bob Mulcahy

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Website: http://www.teledyne-tss.com
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OCEANOGRAPHIC INSTRUMENTS



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A Division of Channel Technologies Group (CTG)

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Bruntland Road
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Tel: +44(0)1224 781123, Fax: +44(0)1224 783407
Email: michael@m-are.com
Website: www.m-are.com
Contact: Mike Kernaghan

MaRE provides an International Brokerage and Equipment Sourcing service to the underwater industry. We are the world's leading source of used ROV systems and components. "DeepSearch", a free-issue database, is distributed monthly highlighting used ROVs and associated equipment for sale worldwide. Our Procurement department offers an equipment and spares sourcing service which complements the brokerage side of the business. MaRE also provides Consultancy on all aspects of remote underwater technology.

SONAR SYSTEMS

Imagenex Technology Corp.

209-1875 Broadway St., Port Coquitlam
BC, Canada, V3C 4Z1
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E-mail: imagenex@shaw.ca
Website: www.imagenex.com
Contact: Steve Curnew

Imagenex is an innovative company specializing in advanced acoustic underwater sensors. The company's products include multibeam, mechanical scanning, and sidescan sonars. The Delta T is a compact, cost-effective multibeam sonar, small enough to fit on most underwater vehicles for obstacle avoidance, navigation and profiling applications. The profiling versions feature an output for real-time 3D plotting and are compatible with third party post-processing software. The Model 881A is a small multi-frequency sonar for imaging or profiling applications. There is an Azimuth Drive available for the 837B Delta T and the 881A for profiling applications from stationary platforms. The Model 881L features improved performance via Ethernet communications. Two sides-

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K.Ruelas, pres.; R. Franklin, v.p., nav & range sys;
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Sound Engineering Solutions – Sonatech, A Division of Channel Technologies Group (CTG) develops innovative solutions for underwater acoustic applications. Existing technologies span a wide variety of acoustic systems, including sonar systems, navigation systems, and custom acoustic solutions. Our solutions are based on a 36-year career of developing high-performance, high-reliability undersea systems that are continually improved through research and development.

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Tel: (805) 683-2575; Fax: (805) 967-8199
E-mail: sales@itc-transducers.com
Website: www.itc-transducers.com.com
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The Science of Sound Performance – ITC, a Division of Channel Technologies Group (CTG), designs and manufactures both custom and off-the-shelf underwater, air, and ultrasonic acoustic transducers, projectors, hydrophones, hydrophone/preamp, side-scan arrays, OEM and end-item products for commercial and military applications.

UNDERWATER THICKNESS GAUGES



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Annapolis, MD 21401 USA
Tel: (410) 267 9771
Fax: (410) 268 2013
E-mail: sales@cygnusinstruments.com
Website: www.cygnusinstruments.com
Contact: Rod Sanders

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UNDERWATER VEHICLES

ROVs



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Houston, TX 77041
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Website: www.f-e-t.com

Forum Energy Technologies' Perry Slingsby brand supplies deepwater work class ROVs, tooling solutions, burial systems, and control-system-based products to the oil, gas, and telecommunications industries. Providing the most advanced, robust and dependable ROVs and subsea products in the world. Forum's Subsea group has facilities in the US and UK and sales offices and agents around the world.



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



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E-mail: sales@sub-atlantic.co.uk
10642 West Little York, Suite 100
Houston, Tx, 77041-4014, USA
Tel: +1 713 329 8730, Fax: +1 713 329 8299
E-mail: sales@sub-atlantic.com
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Forum Energy Technologies' sub-Atlantic brand manufactures world class ROVs ranging from portable units to light work class systems. Sub-Atlantic also supplies thrusters, hydraulic power units, valve packs, compensators and pan and tilt systems to other ROV manufacturers. Sub-Atlantic is part of the FET subsea group and has facilities in the US and UK and sales offices and agents around the world.



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UUVs



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4625 Industry Lane
Durham, NC 27713
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E-mail: frochleder@irobot.com
Website: www.irobot.com
Contact: Friedrich Rochleder, Sales Account Manager

iRobot designs and builds robots that make a difference. iRobot's family of unmanned underwater vehicles (UUVs), including the iRobot IKA Seaglider and iRobot 15A Ranger, perform a variety of missions for researchers, oceanographers and military planners including physical, chemical and biological oceanography, persistent surveillance, marine environmental monitoring and other missions.

UNDERWATER VIDEO EQUIPMENT



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Camera Division
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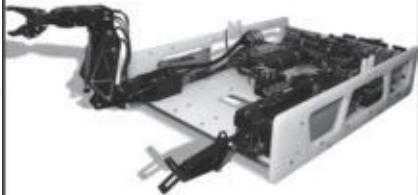
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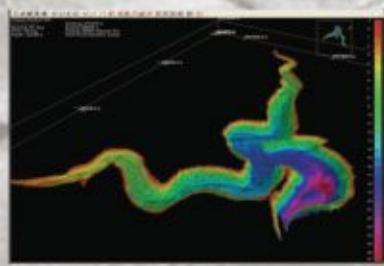
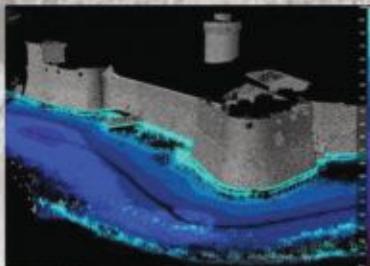
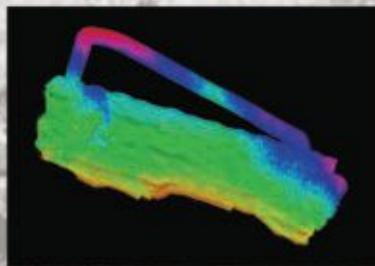
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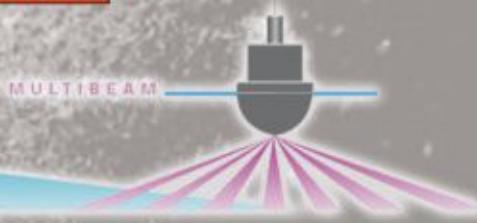
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