News for the Ocean Industry
Ocean News & Technology
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April 2011

Offshore Technology
New Markets Ahead

Autonomous Inspection of Subsea Facilities - A New Reality

Feature Story – Page 10

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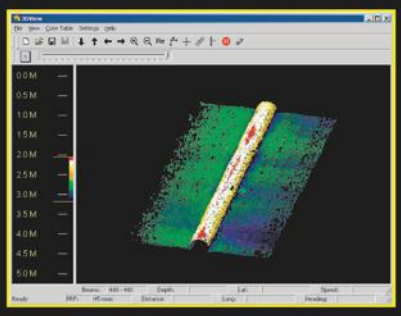

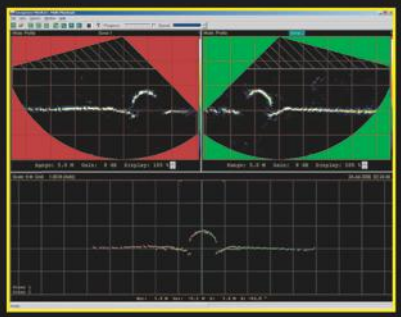

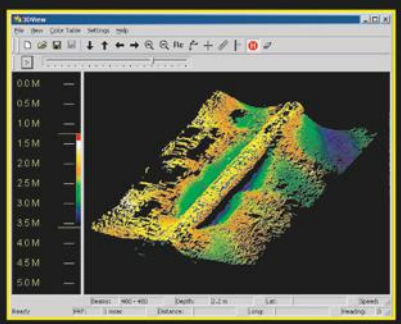

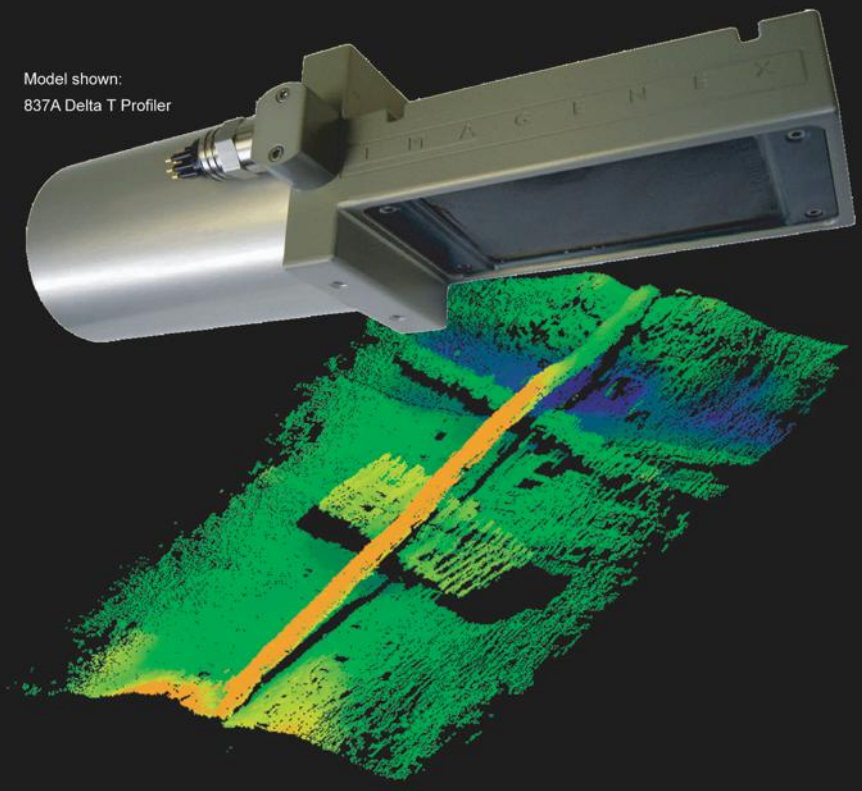

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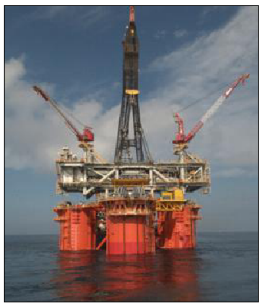

Editorial Focus

Departments

Feature Story

Cover Photo

Cover Photo

The VB 10,000, the newest Versabar heavy lift asset to enter the Gulf of Mexico, shown removing a 2,500-ton topside from its jacket

Photo by: Peter Devine

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More News, More Technology, More Data

in the next issue

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- AUVs & Gliders
- U/W Imaging

Product Focus
- Cameras, Lights & Imaging Sonars

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Ocean News & Technology is published 10 times a year by Technology Systems Corporation, 8502 SW Kansas Avenue, Stuart, FL 34997, telephone 772-221-7720.

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True innovation makes a difference

Editorial

By Ray Tyson

Guess what's on the minds of U.S. Gulf drillers these days

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Foremost on the minds of attendees at next month's Offshore Technology Conference (OTC) in Houston, Texas, particularly those doing or thinking of doing business offshore United States, will no doubt be overwhelming concern with the negligible pace at which the federal government is approving deepwater drilling permits for the Gulf of Mexico.

Republican and Democratic lawmakers alike have urged the Obama administration to significantly step up permitting in the Gulf. Even the federal courts have had enough of the administration's defiance and stalling tactics. After ruling that the government's moratorium on deepwater drilling was arbitrary and capricious, then finding it in contempt, the judge issued an ultimatum — make a decision on at least five drilling permits within 30 days.

By March 23, the U.S. Interior Department's Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) had responded with four permits and a lawsuit challenging the judge's mandate, claiming that the 30-day limit might force the administration into arbitrarily denying permit applications. An appeals court granted a stay pending a decision, further clouding the Gulf permit timetable.

Actually, BOEMRE's repeated claim that it had issued four new permits for drilling deepwater wells is misleading. There were 32 deepwater drilling operations already permitted when Obama imposed his moratorium last year. His Interior Secretary was merely allowing existing permit holders to resume their operations. Moreover, the agency's self-touted approval of Shell's exploration plan for the Auger field, though including proposals for three new wells, does not allow Shell to commence drilling, not without separate permits that had not been approved by the deadline.

"While this is another step in the right direction toward getting our Gulf Coast back to work, this administration is still moving too slowly to get this industry back up and working at full speed," Sen. Mary Landrieu, D-La., said of Shell's plan.

As we all know, the Obama administration, in the name of offshore drilling safety stemming from last year's Deepwater Horizon tragedy, has managed to stymie and dismantle a perfectly good E&P system that has resulted in the safe discovery and production of billions of barrels of oil, with billions more to be had, once companies are allowed to begin drilling more than a token few deepwater wells.

Noble's Clyde Boudreaux drilling rig

The U.S. Gulf probably is our best short-term shot at putting a meaningful dent in our growing dependence on foreign oil, especially from a highly unstable Middle East. So, we pray that Obama and his U.S. Interior Secretary quickly resolve their differences with the current system before any more deepwater rigs depart Gulf waters on long-term contracts elsewhere. Noble Corp. is among the latest victims, moving the Clyde Boudreaux to friendlier and highly productive grounds offshore Brazil. In addition to Noble, Diamond Offshore and other offshore drilling contractors have moved rigs out of the Gulf in response to regulatory delays in issuing new drilling permits.

However, with gasoline prices pushing $4/gallon and maybe going higher, the Obama administration appears mainly focused on the renewable energy agenda at the expense of time-proven hydrocarbons. Drilling permits have slowed to a snail's pace, and oil and gas lease sales cancelled or delayed — the latter which has absolutely nothing to do with well blowouts. Politics aside, there is absolutely no reason why the administration can't pursue both with equal vigor: sustaining our energy needs with oil, gas, and coal, while researching and developing alternatives. This transition likely would take decades to achieve, even if it were possible for renewables to become a significant portion of our overall energy requirements. So, the wise and prudent course must be hydrocarbons first and renewables second.

Unfortunately, U.S. domestic oil production is expected to decline from 5.51 million barrels per day in 2010 to 5.4 million barrels per day in 2011 -- and 5.27 million barrels per day in 2012. The Energy Information Administration has said that is due partly to a decline in Gulf production of 240,000 barrels per day this year and another 200,000 barrels a day in 2012, attributed to the drilling moratorium and the Interior Department's slow pace of approving offshore drilling permits.

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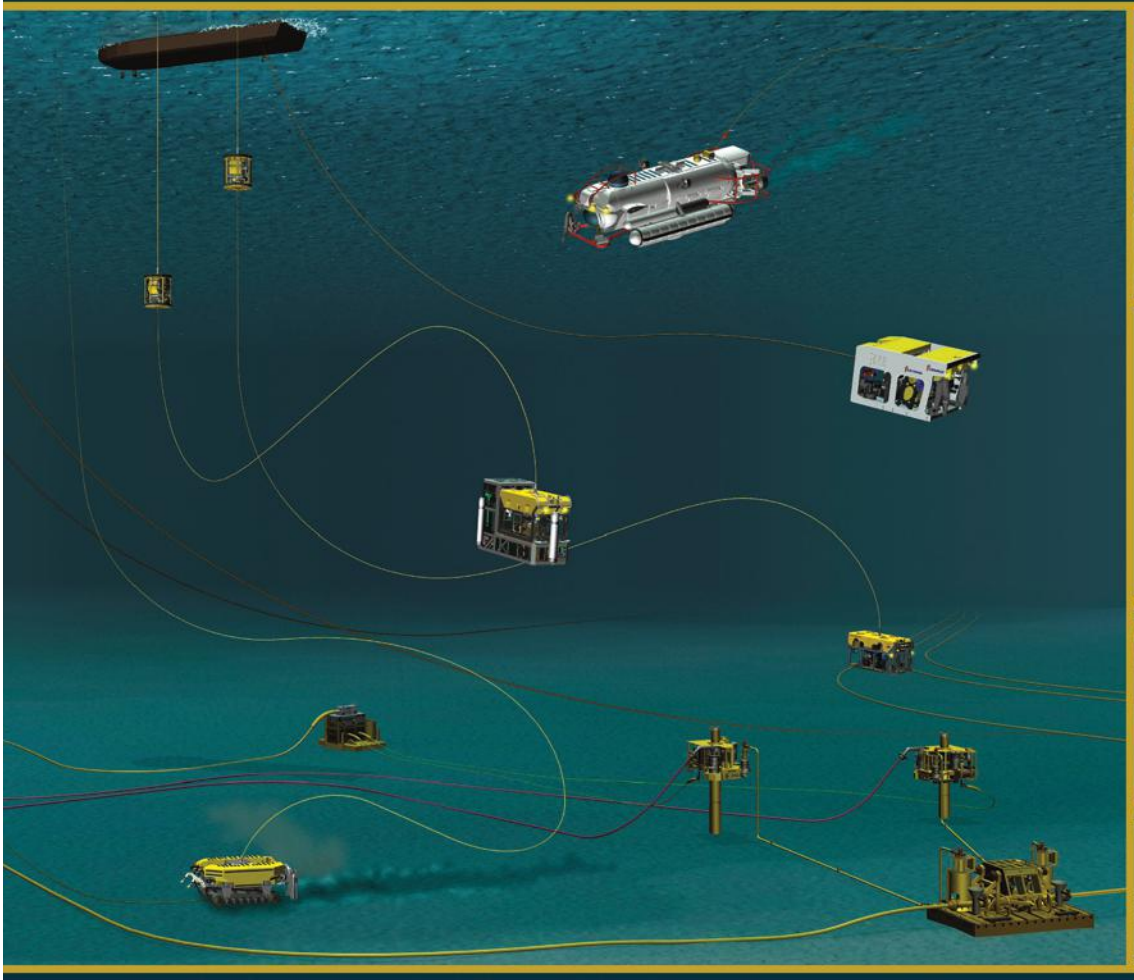

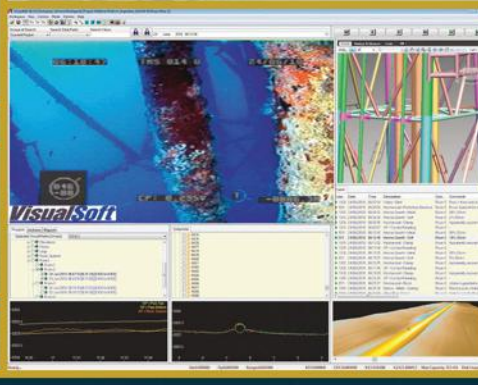

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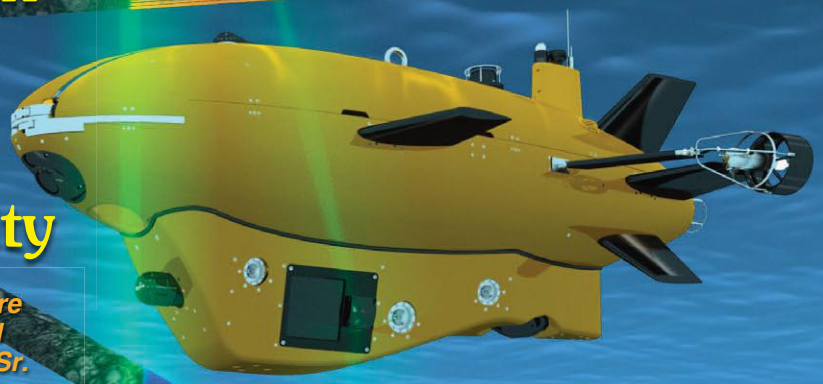
Feature Story

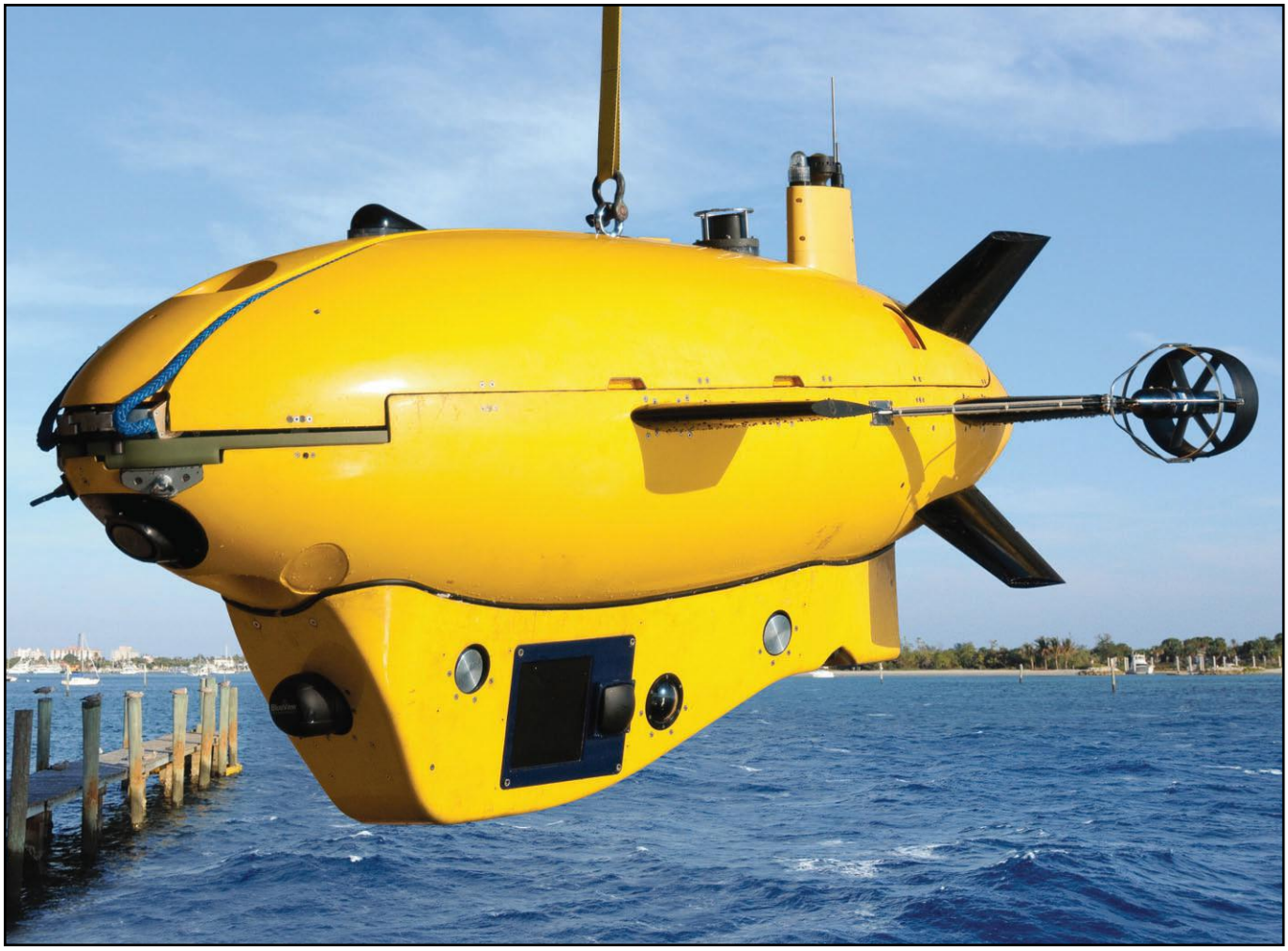
Autonomous Inspection of Subsea Facilities - A New Reality

Lockheed Martin to Offer Autonomous Underwater Vehicle Capability



By Dan McLeod, Director Offshore Systems and Sensors, Lockheed Martin MS2 and John Jacobson Sr. Program Manager Offshore Systems & Sensors Lockheed Martin MS2

Since their introduction into the offshore oil and gas industry in the 1980s, remotely operated vehicles (ROVs) have become a workhorse, performing tasks ranging from simple visual inspection to complex manipulative tasks. Historically, a large percentage of ROV time in the water has been spent on simple visual inspection, a relatively inefficient use of its capabilities.



Marlin™ Offshore Platform Inspection Vehicle

In 2010, Lockheed Martin began multi-year development of an autonomous inspection capability that will ultimately eliminate the need for ROVs or diver inspections, revolutionizing the subsea inspection market. In 2011, Lockheed Martin will demonstrate the initial capability for autonomous inspection of subsea facilities, thereby setting the stage for a new reality in subsea IRM.

Significant technology gaps have prevented autonomous underwater vehicles (AUVs) from becoming an efficient tool for conducting general visual inspection. Over the past year, however, Lockheed Martin engineers have leveraged an innovative combination of software and hardware capabilities that permit subsea inspections using the Marlin™ AUV. Applying internal research and development funds and funding from The Research Partnership to Secure Energy for America (RPSEA), Lockheed Martin has integrated these capabilities onto the Marlin AUV, completed high-fidelity laboratory simulation and testing, and is now conducting at-sea testing to validate this technology.

The Marlin AUV is equipped with advanced autonomous inspection and navigation software and sensors that will produce a geo-tagged 3-D model of an offshore structure. It is supplemented with video and still images of critical inspection points on the structure. This 3-D model with geo-tagged inspection data is produced in a fraction of the time required for an ROV or diver inspection.

Operated from a small utility class vessel or from a fixed or floating platform, the Marlin system performs inspections autonomously, guided by a high-level mission plan generated by shore-based personnel. Marlin's position, health, and status are provided in real time to the supervising crew aboard the support vessel via acoustic link.

The Marlin system is launched using a standard knuckle boom crane. A hallmark of operational simplicity, the Lockheed Martin-patented autonomous homing and docking system facilitates recovery of the vehicle upon transmission of a simple "recover command" sent via acoustic link. Marlin is never left floating on the surface

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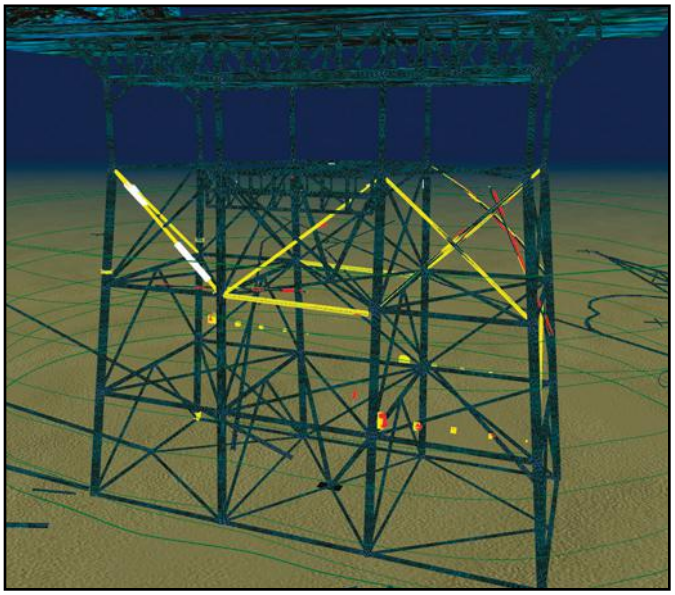


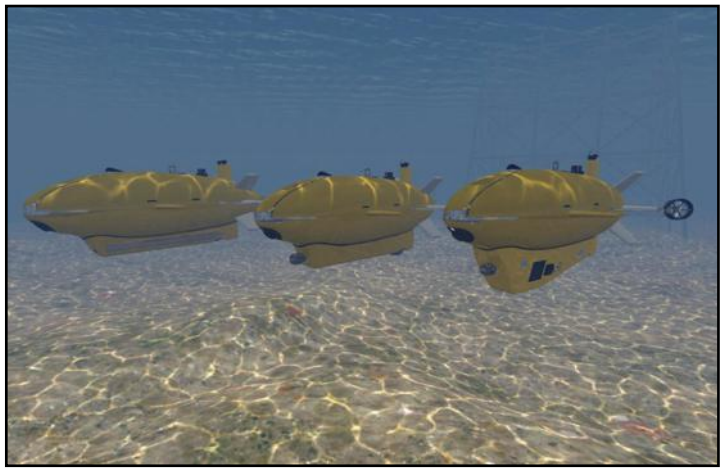
3-D Sonar Imaging and Model Building

for any launch or recovery operation because the single greatest risk for catastrophic damage exists during transition through the air-water interface. The Lockheed Martin method of releasing and capturing the Marlin vehicle underwater greatly increases the safety and efficiency of operations in a variety of sea states and simplifies the operator workload. The simplicity and robustness of this launch and recovery system means that multiple Marlin systems can be operated simultaneously from a single vessel, providing a significant increase in inspection operation efficiency.

Using Lockheed Martin's patented approach, Marlin employs a Coda Octopus Echoscope® Sonar as its primary sensor to rapidly image a structure. Lockheed Martin's proprietary software constructs a 3-D model of the structure in real time using the high-density multiple aspect data generated by the Echoscope® Sonar. The sonar beams penetrate deep into the structure, ensonifying internal and external platform structural elements. The resulting 3-D sonar data is tagged with precise position data and then processed by perception software algorithms to create an accurate, geo-registered 3-D model of the subsea structure, unencumbered by local sea water visibility limitations.

In this new reality, operators and maintainers of offshore facilities will be equipped with an accurate subsea structure representation from surface to seabed that can be used for asset integrity management planning and periodic inspection, maintenance, and repair tasks. A major benefit of the Marlin system is that it provides operating companies with autonomous change detection when employed on subsequent inspections. This function greatly reduces platform startup time after calamitous events such as hurricanes or accidental structural damage. Every positive and negative change from the baseline is automatically identified by Marlin, and the 3-D model is augmented with high-resolution video or still images that document the damaged area — all without human intervention. Marlin includes GIS-based software that collects, stores, catalogs, manipulates and displays its inspection data in a variety of data formats.

Employing interchangeable payload packages, the Marlin can also be reconfigured to support a wide range of sensors, such as bathymetric sonar, side-scan sonar, underwater laser line scanner, corrosion potential sensors and high-definition stereo photogrammetric cameras. Future versions of Marlin will be rated to 4,000m depths and will include the capabilities to perform pipeline and riser inspection and light intervention tasks such as CP measurement, flooded member detection, and cleaning and inspection.



Marlin is readily configured with sensor packages to suit customer needs

The Macondo disaster of 2010 highlighted the need to increase the safety of offshore operations to protect our environment and reduce the probability of such disasters in the future. In the post-Macondo era, the Marlin AUV offers the industry a revolutionary new integrity management tool that can provide subsea inspection data more frequently and at a lower cost while also decreasing the number of personnel at sea. In addition, the environmentally friendly Marlin can operate from smaller vessels with a reduced carbon footprint and will provide end users with geo-registered inspection data that is more accessible and useful than today's video inspection data. With the implementation of autonomous subsea inspection of subsea facilities, a new reality in subsea inspection has arrived.

Technology validation tests will be conducted this summer using the Marlin AUV on offshore platforms in the U.S. Gulf of Mexico with participation from a major oil and gas operating company and RPSEA. This revolutionary capability will be offered to the offshore oil and gas industry in 2012.

For more information, visit www.lockheedmartin.com/products/MARLIN.

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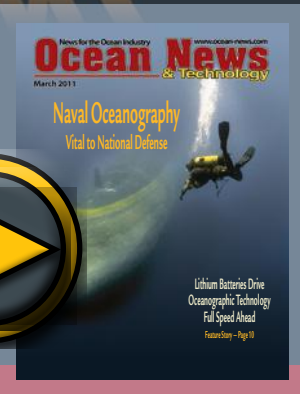

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Largest earthquake since 1900 hits Japan; not enough tsunami warning

On March 11, disaster struck Japan as a massive 8.9 magnitude earthquake generated a wall of water that surged over the east coast of the island nation, sweeping many to their deaths.

Japan is situated along the world's most active earthquake belt, the Pacific Ring of Fire, where rigid plates in the Earth's crust collide along the rim of the Pacific Ocean. This earthquake originated 231 miles (373k) northeast of Tokyo and 80 miles (130km) east of Sendai, Honshu in the Pacific Ocean. The earthquake occurred at a depth of about 15.2 miles (24.4km).

In this area, the Pacific Plate is moving almost due west and being pushed down into the Earth's interior along a trench off Japan's east coast. On average, the Pacific Plate moves 3.5 inches (8.9cm) per year, but this process is not continuous, according to scientists.

Movement may stop as the plates stick together for a period and energy will build up, so when the movement does finally occur, it is much more dramatic.

The process of one plate being pushed beneath another is called subduction, and it occurs all along the Ring of Fire, producing other earthquakes, including the 7.7 magnitude quake that struck off the coast of Indonesia in October.

While the magnitude estimate of this latest earthquake may later be revised, 8.9 is the largest Japanese quake on record and the fifth-largest quake worldwide since 1900, according to the U.S. Geological Survey (USGS).

There has to be certain conditions for a tsunami to result from an earthquake.

First, the magnitude of the quake must exceed a certain threshold. The 8.9-magnitude of Japan's earthquake was enough to trigger a tsunami, but the 7.7 magnitude earthquake that struck Indonesia in October 2010 just surpassed the threshold for causing a tsunami.

Earthquakes below 7.5 or 7.0 usually do not trigger tsunamis, says the USGS National Earthquake Information Center.

Once an earthquake like this one has occurred, it's possible to assess whether or not it will generate a tsunami by determining whether a vertical shift occurred at the fault and by looking at measurements of water height recorded around the Pacific Ocean basin by the Tsunami Warning Network.

Earthquakes trigger tsunamis when the seismic activity causes the land along fault lines to move up or down. When parts of the seafloor shift vertically entire water columns become displaced. This creates a "wave" of energy, which propels the water.

The warning network alerts people living in the area that will possibly be hit by a tsunami."Unfortunately, the closer you get to the earthquake, the less time you have. Clearly in the case of the country of Japan, they did not have had much warning at all.

In Japan, the tsunami warning went out about five minutes after the earthquake and included an estimated height for the waves. Reports of the time between the warning and the arrival of the giant waves varied.

The earthquake and tsunami in Japan have actually moved the island closer to the United States and shifted the planet's axis. The quake caused a rift 15 miles below the sea floor that stretched 186 miles long and 93 miles wide, according to the AP. The areas closest to the epicenter of the quake jumped a full 13 feet closer to the United States, according to the USGS.

The quake also shifted the earth's axis by 6.5 inches, shortened the day by 1.6 microseconds, and sank Japan downward by about two feet. As Japan's eastern coastline sunk, the tsunami's waves rolled in. The Earth's mass shifted towards the center, spurring the planet to spin a bit faster.

After the country's 1995 earthquake, Japan placed high-tech sensors around the country to observe even the slightest movements, which is why scientists are able to calculate the quake's impact down to the inch.

OMISSION

In the Jan/Feb issue of ON&T we failed to credit the cover photo. The photo was taken by Christian Skauge. Our apologies to Mr. Skauge.

PASSED ON

Pat Chambers, the founder owner of Howard Chambers Ltd., passed away this year. He came into the diving /NDT industry by joining OSEL Ltd in Gt. Yarmouth in 1980 and from then remained active and inventive for the next 30 years. He was responsible for the launch of a number of new products such as the OSEL MPI System, Gascomag, Hydroscan Camera and the original ACPD unit.

Christian J. Lambertsen, a scientist and doctor who invented SCUBA, died at the age of 93 February 11. Among his honors are the highest civilian awards from the Defense Department and the USCG. In 2000, Navy SEALs proclaimed him "the Father of U.S. Combat Swimming."

Andre Rossfelder passed away in February. He played on a world stage with such luminaries as Jacques Cousteau, French philosopher Albert Camus, and French President Charles de Gaulle. During his life, he published four novels, a geographical treatise, and a volume of recollections including detailed accounts of his several attempts to assassinate de Gaulle. These attempts on de Gaulle's life were also chronicled in the famous movie *The Day of the Jackal*. Andre discovered oil in Algeria, was a paratrooper who fought in the Battle of the Bulge, and invented modern vibracoring. Last year, he published his first book in English, "*In Pursuit of Longitude: Magellan and the Antemeridian*." His vibracore heads set the gold standard for collecting sediment cores.

REPORTS

Report released on failed BOP — A federal probe has found that a trapped piece of drill pipe prevented a key failsafe device from properly sealing off the blown oil well that caused last year's massive BP Gulf oil spill, according to a report released recently. The 551-page report said the device, known as a blowout preventer, failed to work properly because the piece of drill pipe kept its blind shear rams from sealing the well around the time of the April 20 oil rig explosion off the coast of Louisiana. Shear rams are components in a blowout preventer that cut, or shear, through drill pipe and form a seal against well pressure.

ISE receives AUV support contract from Canadian Department of Defense

ISE Program Manager Jean Marc Laframboise and Electronics Technician Mei Jin close the hull of one of the Arctic Explorer AUVs prior to deployment. This work is part of a new operations support contract that the company recently received from the Canadian Department of National Defense (DND). The Explorer AUVs were built by International Submarine Engineering Ltd. and are jointly owned by Natural Resources Canada (NRCan) and DND. They are being used to help define the northern extent of Canada's extended continental shelf under the provisions of Article 76 of the United Nations Convention on the Law of the Sea.

These AUVs have a range of over 450km and a depth rating of 5,000m. They are fitted with both a single beam and a multibeam echosounder. The single beam echosounder provides accurate depth soundings while the multibeam provides seabed imagery in the vicinity of the spot soundings. This information is combined with position data from the AUV's Inertial Navigation Unit to provide scientists with a geographically-referenced data set of the seafloor.

The AUVs were tested in open waters near Vancouver, British Columbia this February to validate improvements made after the successful 2010 arctic operations. The vehicles will be deployed to the Canadian Icebreaker CCGS Louis S. St. Laurent for underway testing from St. Johns, NF in April 2011. In the late summer and fall of this year, the Louis S. St. Laurent and the American Icebreaker USCGC Healy will conduct survey operations in the high arctic. Operating from the Louis S. St. Laurent, a team of ISE, DND, and NRCan personnel will use the AUVs to conduct seafloor mapping in areas where it is not possible to operate the icebreakers.

This will be ISE's 12th deployment to the Canadian Arctic and its fifth season of actual under-ice AUV operations.

To date, ISE has conducted over 2,000km of under-ice operations with AUVs reaching depths of 3,160m. In the aggregate, ISE AUVs have completed over 120,000km of operations under water and under ice.

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

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U.S. Coast Guard, U.S. Customs and Border Protection announce DHS Small Vessel Security Strategy Implementation Plan

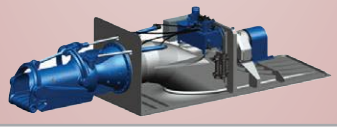
U.S. Coast Guard and U.S. Customs and Border Protection officials joined federal, state, local and tribal authorities and private sector stakeholders at the Homeland Security Studies and Analysis Institute, Arlington, Va., Friday to discuss and announce publication of the Department of Homeland Security Small Vessel Security Strategy Implementation Plan. The Small Vessel Security Strategy Implementation Plan outlines the methods and actions required to reduce and mitigate the potential exploitation of small vessels by terrorists or other threats to attack U.S. maritime ports, shores, and waterways. The Plan maps how existing programs and stakeholders will work together and what research and development will be conducted to refine or create needed capabilities for the strategy as a whole to implement the 2008 Small Vessel Security Strategy.

ABS and HHI evaluate LNG carrier designs for ice operations

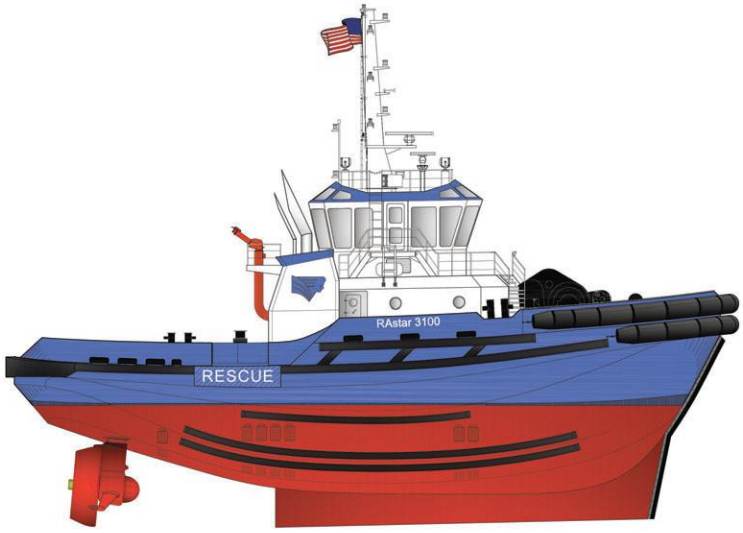
Class society ABS has been collaborating with Korea's Hyundai Heavy Industries (HHI) to evaluate the basic design and containment system parameters for an LNG carrier operating in an Arctic environment. Specifically, the carrier would operate a trade route from the Kara Sea and Barents Sea to Europe or the United States. The industry has accumulated plenty of operating experience for LNG carriers, however, experience of large LNG carriers operating in Arctic waters is very limited. There are many technical concerns related to the structural strength of LNG carriers subject to intensive ice loads. These include strengthening of the hull, the interaction of the hull structure with the containment system, minimum propulsion power requirements, and strength of the propeller. To address these issues, ship and ice interaction scenarios have been investigated primarily using Finite Element (FE) analysis tools. Based on FE results and assessment criteria, the effects to the cargo containment systems in LNG carriers can be evaluated. ABS has combined its LNG classification experience with the knowledge gained through its Harsh Environment Program to provide industry with guidance on these vessels to be operated in ice-covered waters.

New waterjets for ferries, yachts, naval vessels

Wärtsilä, a marine industry's leading solutions provider, has introduced a new series of waterjet solutions. This new mid-size series enhances Wärtsilä's competitive range of stainless steel jets to include all sizes from 510mm to 3,250mm. This makes Wärtsilä the only supplier serving both mid-size and the lower range of large Waterjet applications with a single product. The new series is aimed particularly at the high-speed ferry, high-speed patrol craft, and customized yachting segments.



New EPA Tier 3 compliant engines to be installed on Signet Maritimes ASD tugs for LNG



RAstar 3100 Signet Maritime tug, slated for October 2011 delivery, will provide marine services for Angola LNG Supply Services (ALSS).

Signet Maritime Corporation announced they are the first to install the Cat® C175 ACERT 16-cylinder main propulsion diesel engines rated at 3417 BHP each on their two support/escort tugs being built in Gulfport, Mississippi. These engines represent the next generation in technology for addressing the needs of emissions and hazardous location applications and meet offshore emissions requirements, including EPA Tier 3, EU Stage IIIA, and IMO Marine Tier II. The Robert Allan Ltd. designed RAstar 3100 class tugs are engineered to provide superior ship handling, escort, and sea-keeping performance. Slated for an October 2011 delivery, these highly specialized terminal support/escort tugs will provide marine services for Angola LNG Supply Services (ALSS) vessels into the Port of Pascagoula.

J. Barry Snyder, President of Signet Maritime, stated, "A vital evolution for this decade is the initiation of Tier 3 environmental protection with internal combustion engines, and we are the first to install the new Cat C175-16 EPA Tier 3 engines on ASD tugs." Signet is a strong proponent of using green technology and protecting the environment; using these new engines will result in lower emissions, improved performance, and reduced fuel consumption. The new engines accomplish this with the support of the Cat ACERT technology, which is a combination of advanced electronics/monitoring systems, increased engine efficiencies through computer aided design, and modernized common rail fuel injection systems.

For more information, visit www.signetmaritime.com.

Mammoet Salvage completes salvage of Cabo de Hornos

Mammoet Salvage successfully refloated the research vessel Cabo de Hornos safely and redelivered her back to her owners, The ASMAR Shipyard in Talcahuano, Chile. The vessel was being built at the ASMAR Shipyard located in Talcahuano Naval Base when, on February 27, 2010, one of the largest earth quakes ever recorded hit the central region of Chile. The movement of the earthquake caused an accidental premature launch and the vessel slid into the sea.

The Cabo de Hornos was planned to be launched on that February 27 in a formal ceremony in presence of the Chilean President. After the premature launch and several minutes drifting, the vessel was picked up by the Tsunami and washed back on to land on the opposite side of the shipyard. On November 12, 2010, the salvage contract to refloat the Cabo de Hornos was awarded to Mammoet Salvage. Mammoet Salvage offered an unconventional salvage solution by proposing to drive the vessel on to a flat-top deck barge with the Self Propelled Modular Trailers (SPMTs) from other operating companies in the Mammoet Group. The barge would be completely submerged in dry-dock and the vessel would be floated off.

Mammoet's in-house engineering department prepared the calculations for the transport and lifting method and designed the supports for the vessel. The total weight of the transport, including supports, would be 2,000 tons. A slope had to be built to drive the vessel to the graven dry-dock of the ASMAR Shipyard. Because the vessel was beached on soft sand, the whole area had to be excavated and one meter of soil was removed and hardened. After signing the contract, a team was sent out to commence the construction of the supports as well as the civil works for the road.

The road to the dry-dock had to be prepared for a load of 30 tons per square meter.

In total, 31 containers with heavy transport equipment were mobilized from the various Mammoet facilities worldwide. A 300-ft. barge was mobilized from Morgan City, Louisiana. On January 26th, Cabo de Hornos was lifted with the SPMTs, after which she was carefully transported to the dry dock wall. On January 27, Mammoet Salvage drove the Cabo de Hornos safely onto the barge moored in the dry-dock. On January 29, the Cabo de Hornos was floated off the barge and safely redelivered to the owners without additional damage.

Liquid cargo handling simulator in training center

L-3 MPRI, a global provider of integrated training solutions, which includes simulation-based training systems, services, and turnkey training facilities, announced the installation of its Safe Cargo Liquid Cargo Handling

Simulator (LCHS) in Bernhard Schulte Shipmanagement's (BSM) new Maritime Training Centre, which officially opened on January 21, 2011 in Manila, Philippines. The simulator will be used to train and enhance the skills of personnel operating BSM's extensive fleet of owned and managed liquid cargo vessels. BSM, one of the world's largest ship management companies, is firmly committed to the Philippines and currently has over 7,000 Filipino seafarers in its pool.

L-3 MPRI's Safe Cargo system is composed of one instructor and six student work stations, each fitted with dual monitor displays and equipped with three ship models, allowing training to be conducted in all the main liquid cargo disciplines of chemical, gas, and oil operations. It is also one of the first installations to use the new 5.0 version of the LCHS software. To assist with system setup, L-3 MPRI is additionally providing course materials for all three vessel types as well as specialized training for future instructors, both in the technical operation of the simulator and the training techniques that should be used to ensure best practices.

The LCHS installation in Manila continues a long-standing relationship between BSM and L-3 MPRI.

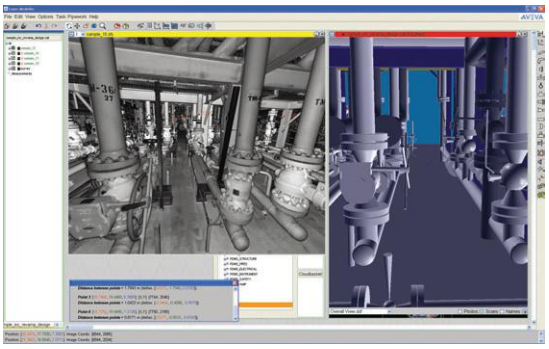
In addition to the Philippines, BSM, with its strong focus on continuous improvement in all areas of its operation, has also invested in LCHS systems and bridge and engine simulators in its training centers in Cyprus, India and Poland.

For more information, visit www.mpri.com/maritime/index.php/content/products_lchs/lchs/.

AVEVA expands laser scan portfolio with next generation 3D model

AVEVA, a leader in engineering design and information management solutions for the plant, power and marine industries, recently announced the launch of the new AVEVA Laser Modeller solution. An integral part of AVEVA's larger laser scan strategy, AVEVA Laser Modeller rapidly and cost-effectively transforms laser scan data into intelligent, as-built 3-D plant models. Creation of an accurate 3-D model for existing brownfield facilities allows Owner Operators to optimize the operations of their assets and significantly reduce the lead time on upgrade and revamp projects in a way that is simply not possible with historic applications.

Traditional techniques for converting laser scan data into an intelligent 3-D model require many days of costly modelling services for each hour of scanning time. In most cases, the cost is too high to justify the total investment in 3D. Laser Modeller changes the fundamental ground rules by automating most aspects of the modelling process, producing a fully intelligent 3-D model at a fraction of the time and cost of existing techniques.



Laser Modeller can accept scan data from any of the leading laser scanning vendors so users are not locked into a specific hardware supplier. It directly generates 3D models to feed into a visual asset management strategy, and for Brownfield projects using native PDMS component catalogues, delivers a fully intelligent PDMS model. This completely transforms the modelling process by eliminating the unnecessary service intensive steps, and dramatically reducing the time and cost of model creation.

For more information, visit www.avea.com.

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Ocean Science

Neptune Canada tracks tsunami data

The NEPTUNE Canada ocean network, part of the Ocean Networks Canada Observatory led by the University of Victoria, has posted new data on the tsunami waves as they neared the British Columbia coast after crossing the Pacific Ocean from Japan in the wake of its devastating earthquake. The data were fed to the Canadian Department of Fisheries and Oceans, which is responsible for handling the tsunami response in Canada. Data on tremors and waves that register on NEPTUNE Canada also go to IRIS, a the global network of earthquake information. NEPTUNE Canada scientists will continue to post new data as it becomes available. Go to www.neptunecanada.ca and check under "news stories" for the latest updates.

$6.8 million offshore R&D Center announced in St. John's

A $6.8 million investment to establish the Suncor Energy Offshore Research and Development Center was announced this week in St. John's, Newfoundland. The new facility will expand Memorial University of Newfoundland's S. J. Carew Building, which currently houses the Faculty of Engineering and Applied Sciences.

Newly discovered deep sea lobster named for Rockefeller's Jesse Ausubel

Some scientists receive prizes for their contributions to science, others find themselves on postage stamps. Rockefeller University's Jesse Ausubel name is now immortalized in the scientific name of a newly discovered, rare new genus of deepwater lobster. Ausubel was given this honor as a tribute to his contributions to the success of the Census of Marine Life, which he co-founded. Discovered by an international trio of scientists, the lobster, *Dinochelus ausubeli*, lives in the deep ocean water. The new lobster has a mighty claw with a short, bulbous palm and extremely long, spiny fingers.

Underwater laser scanner provides insights to early life on earth

The Geology Department of the University of California, Davis is conducting research into the early life on Earth through funding from NASA Astrobiology: Exobiology and Evolutionary Biology. The oldest fossils of life consist of stromatolites, which are millimeter to meter high structures created by the growth of bacteria. The shapes of stromatolites reflect both environmental and biological processes. Research is being conducted on the bacterial structures in ice-covered lakes in Antarctica because they have similar shapes to fossil bacterial communities. Using the ULS-100, Dr. Dawn Sumner and her team from UC Davis and the SETI Institute were able to successfully capture digital 3-D models of the structure of these organisms. With these data, her team quantitatively defined the shapes of the living bacterial communities for comparison with fossilized specimens.

Teledyne Webb wins coastal glider contract for the OOI

Teledyne Webb Research (TWR) announced that it has been selected to provide coastal gliders for the Ocean Observatories Initiative (OOI). The Slocum G2 gliders will support the Pioneer and the Endurance Arrays of the Coastal and Global Scale Nodes (CGSN) of the OOI. The contract, valued at up to $5.6 million, includes a prototype vehicle to be delivered this year that will incorporate the specific sensor requirements of the CGSN. Production units will be delivered beginning in April 2012. The initial contract award is $260,000. Teledyne Webb Research was chosen by The Consortium for Ocean Leadership and the Woods Hole Oceanographic Institute (WHOI) to provide the gliders for this project that is funded by the National Science Foundation (NSF).

The Slocum G2 gliders are designed for long deployment endurance with the ability to maneuver and operate where the total water depth is less than 30m and up to 1,000m along deeper coastlines. The uniquely modular vehicle construction facilitates both swappable payload bays for a multitude of integrated sensor suites and optimized buoyancy control for various depth regimes.

The OOI is a multi-scale observatory that will utilize a network of sensor systems to collect physical, chemical, geological and biological data from the ocean and the seafloor on coastal, regional and global scales. A unique cyber infrastructure will make the data available to anyone with an Internet connection. The information will increase understanding of climate change, ocean and coastal ecosystems, environmental health and climate, and biodiversity.

"Teledyne is very pleased and excited to be part of the OOI team," said Clayton Jones, Senior Director for Technology at TWR. "Our collective vision is to provide sensor platforms that will allow us to better understand the interior of the world's oceans. The framework of OOI is an outstanding example of such an effort, and we are proud that Slocum gliders will be a key element in the network with their sustained adaptive monitoring capabilities."

Gliders were first conceived by Douglas Webb, the founder of Webb Research and a former researcher at the Woods Hole Oceanographic Institution (WHOI). The Slocum G2 Glider is a torpedo-shaped autonomous underwater winged vehicle that measures 1.5m and uses changes in buoyancy along with its wings and tail-fin steering to move through the water.

For more information on the OOI visit http://www.oceanleadership.org/programs-and-partnerships/ocean-observing/.

Taiwan to deploy first seabed quake sensor

Taiwan's Central Weather Bureau (CWB) announced that it will soon install its first system to sense undersea seismic movements that may herald earthquakes or tsunamis. The island is vulnerable to the type of offshore earthquake that ravaged Japan recently.

The system consists of a seabed sensor linked via a 45km cable to computers on land that process and relay the signal. The sensor will be placed on the ocean floor about 300m deep to pick up irregular water movements or changes in water temperature indicating a quake or massive wave.

It will send that information back to servers at the CWB's data center, adding to any other early detection signals the Bureau has already received. Software will process the signals and, if an earthquake is detected, mobile phone operators will be advised to send emergency warnings by text message.

CWB expects the sea warning system to give an average of 10 seconds extra warning by putting sensory equipment closer to would-be seismic activity. That gives people more time to evacuate buildings and shut down transportation systems. The system would offer several minutes' warning of tsunamis.

NEC Corporation won a bid to design the system, which will cost US$14.23 million.

Although Taiwan's announcement comes just days after the magnitude 9.0 quake in Japan, one of the strongest in history, the island government had been planning it for years because 70% of the quakes felt on land are centered offshore. The last major quake in Taiwan, in 1999, killed 2,400 people and injured about 11,300.

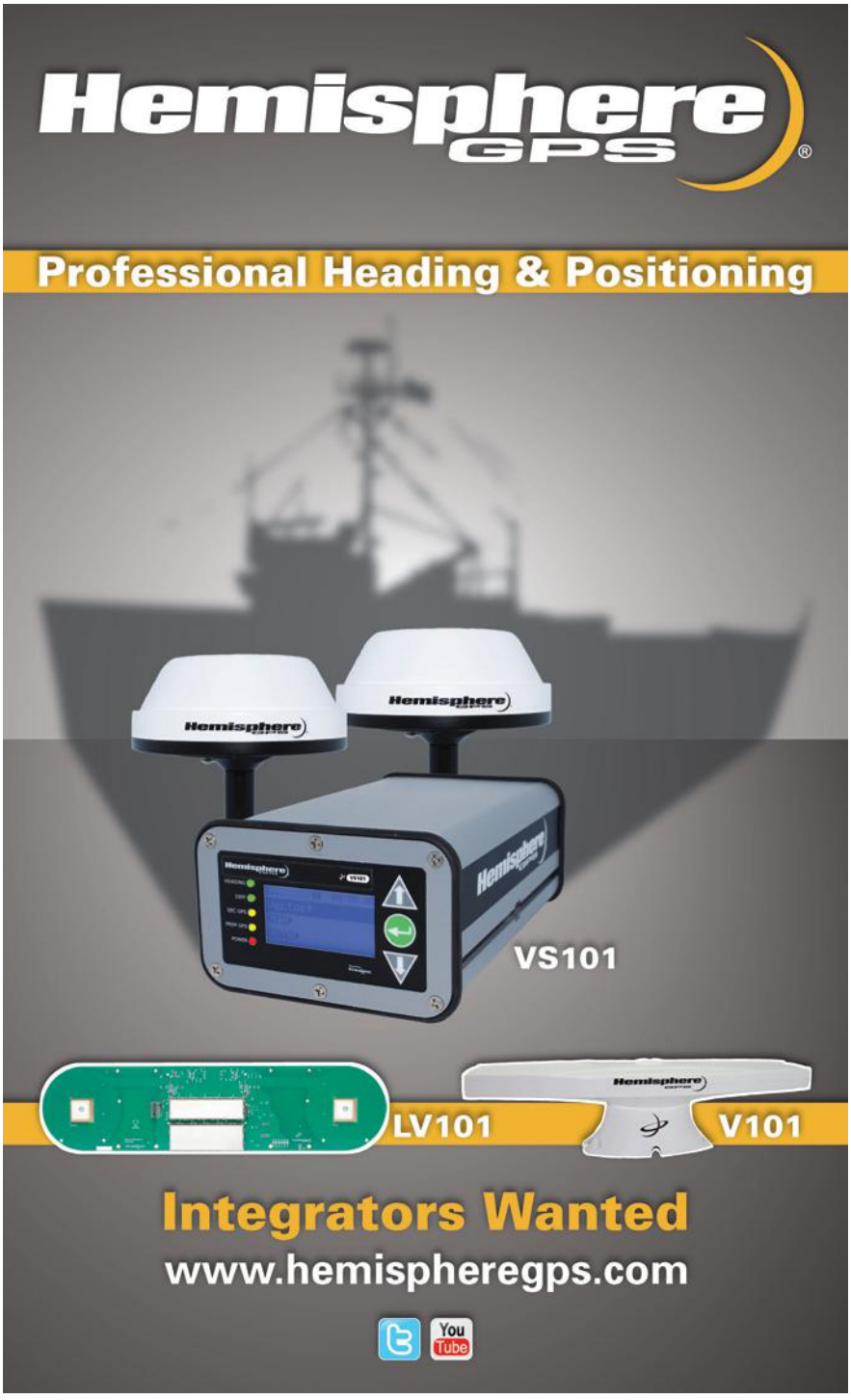
Taiwan may install more undersea detection systems in years ahead, budget permitting, CWB said.

Taiwan officials say they are also ready to test land-based quake detection equipment following more advanced systems in Japan and the U.S.

Observing system to see marine animal migration

For the first time, data from electronic tags attached to marine animals will be incorporated into the U.S. Integrated Ocean Observing System (IOOS®), a NOAA-led national partnership committed to enhancing our ability to collect, deliver, and use ocean information. The addition of this biological component will help scientists better understand how marine animals move with the flow of tides and currents and provide insight into how they may alter their behavior or migration patterns in response to climate change. "Data from these animals are transforming the way scientists study our waters and opening up new data sources," said Zdenka Willis, U.S. IOOS® director. "With the broader science community becoming more engaged and linking to IOOS, we will be able to provide information more readily to the state and federal officials who need it most."

"The vastness of the ocean limits our ability to observe," said Barbara Block, Prothro professor of marine sciences at Stanford University. "This technology is leading to profound advancements in our understanding of these animals and how they interact with the ocean. This knowledge translates to a better understanding of our planet and emerging issues on climate change." Scientists began widely using marine animal tagging technology in the 1990s on tuna, sharks, sea turtles, seals,



whales, salmon, squid, and crustaceans, among others. Sensors track the animals over long distances for multiple years, collecting valuable data below the surface from remote and difficult-to-reach environments where conventional oceanographic sensing techniques are technically or economically unfeasible. However, data are collected in different ways for varying applications. A major challenge is to better synchronize the many different tagging programs and improve data sharing to the broader ocean science community.

"The animal tagging community has made great strides in data sharing, collection, and analysis, but we want to create a stronger bridge among these scientists and other ocean observers," said Churchill Grimes, Ph.D., director of NOAA Fisheries' Santa Cruz Laboratory. Block and Grimes joined IOOS and other federal, state and academic scientists this week in Santa Cruz, California, to establish a framework for integrating biological observations to the IOOS, which is expected to begin as early as this fall. IOOS is a federal, regional, and private-sector partnership working to enhance our ability to collect, deliver, and use ocean information. IOOS delivers the data and information needed to increase understanding of our oceans and coasts, so that decision-makers can act to improve safety, enhance the economy and protect the environment. NOAA's mission is to understand and predict changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and to conserve and manage our coastal and marine resources.

For more information, visit www.noaa.gov.

Most extensive study of ocean plastic pollution ever undertaken

Capping the most extensive study of ocean plastic pollution ever undertaken, pioneering researchers with the 5 Gyres Institute launched a voyage on Saturday, March 19 through the fifth of five global subtropical gyres, the massive swirling areas of the ocean where plastic pollution accumulates.

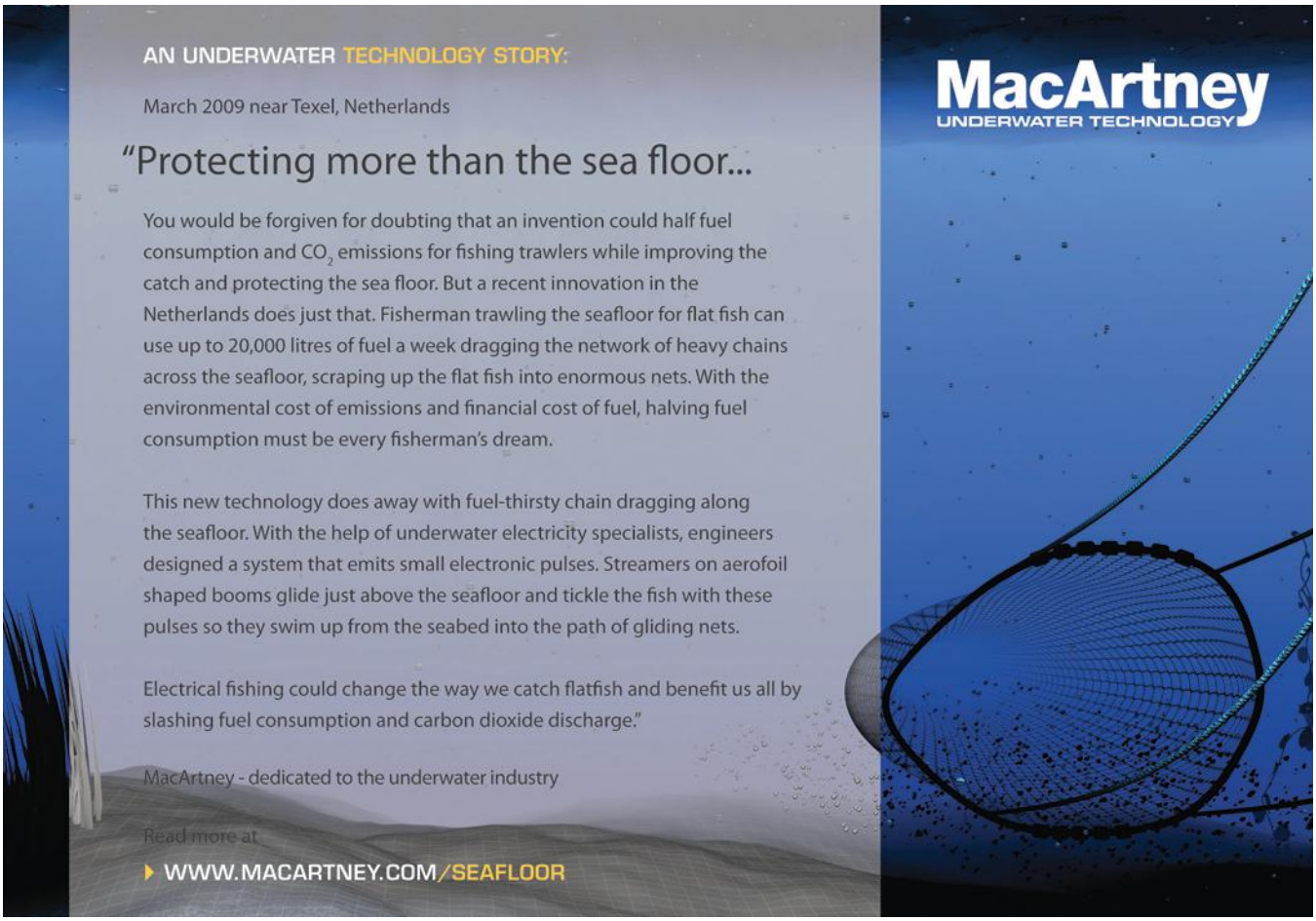
The crew will sail over 2,000 miles from Valdivia, Chile, zig-zagging through the South Pacific Gyre, to arrive at Easter Island on April 7, and onward to Tahiti on May 10. Little data on plastic in this region exists, but the researchers expect to find the same kind of plastic pollution — known to harm marine life, to be a navigational hazard, and to possibly threaten human health — that they have found in every sample of the sea surface they've taken while sailing 20,000 miles through gyres in the North Pacific, North Atlantic, South Atlantic and Indian Oceans.

No other such researchers have sailed through all of the world's five subtropical gyres. 5 Gyres's goal is to document the problem, bring it to the world's attention, and foster solutions.

Most ocean plastic pollution takes the form of tiny plastic fragments resulting from degraded derelict fishing gear or plastic waste flowing out to sea from land. Sea turtles, marine mammals, birds, and fish ingest these plastic particles, causing entanglement or accumulation of synthetic chemicals in their bodies from the plastic in their gut. The pollution can also kill seabirds and marine mammals that die after mistaking the plastic for food.

5 Gyres is also studying whether humans are being harmed by eating fish that have ingested debris contaminated with PCBs, DDT, and other toxins.

For more information, visit www.5gyres.org.



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EU wind sector calls for binding 2030 target

The EU must adopt a binding renewable energy target for 2030 to secure long-term investment in renewable energy. Arthouros Zervos, president of the European Wind Energy Association (EWEA), warned, "the wind industry expects to invest some 400 billion Euros in Europe between now and 2030. To do so, it needs stable and certain EU energy policy." In a new report, "EU Energy Policy to 2050," EWEA argues that the renewable energy targets set so far have enabled Europe to become a world leader in renewable energy technologies, and reduce greenhouse gas emissions. Therefore, the report argues, this successful policy should be repeated for the period after 2020, together with the support of an Emissions Performance Standard and a tighter Emissions Trading System. EWEA supports an overall EU renewable energy target as proposed by the European Renewable Energy Council (EREC). The EREC believes that not less than 45% of the EU's total energy consumption can come from renewable sources by 2030.

Secretary of State for Energy and Climate Change Chris Huhne welcomes £3 million marine renewable energy contract

Secretary of State for Energy and Climate Change Chris Huhne February 22 welcomed a £3 million marine renewable energy contract between Edinburgh-based wave energy developer Aquamarine Power and Falmouth-based marine drilling specialists Fugro Seacore (Seacore). The contract is to install the foundation system for Aquamarine Power's next-generation wave energy device, known as Oyster 2, which will be installed in Orkney this summer. "This is good news for the British marine energy sector - from here in Falmouth to Orkney where the Oyster device will be deployed," Mr. Huhne said. Seacore will commence drilling and installation of steel piles for three Oyster devices this summer at Billia Croo near Stromness in Orkney. The company previously installed the piles for Aquamarine Power's Oyster 1, also at Billia Croo, which was installed in 2009. Aquamarine Power will install a single Oyster 2 device this summer with a further two devices to be put in place in 2012. Together ,the three Oyster 2 devices will form a 2.4MW array connected to a single onshore generating plant.

DOE offers loan guarantee to support Maine wind project

DOE announced on March 3 its offer of a conditional commitment to Record Hill Wind LLC for a $102 million loan guarantee. The loan guarantee will support the Record Hill wind project, which includes a 50.6MW wind power plant and an 8-mile transmission line near Roxbury, Maine. The project is expected to create 200 construction jobs in Maine and will avoid more than 70,000 tons of carbon pollution annually, an amount equivalent to the annual greenhouse gas emissions from more than 13,000 passenger vehicles. The wind facility will consist of 22 2.3MW turbines and new transmission lines to interconnect with Central Maine Power Company, the local utility. The turbines will be installed with innovative "turbine load control" technology, a system of sensors and processing software that allows the turbines to continue to generate electricity under turbulent conditions, rather than be shut down completely. DOE's Loan Programs Office has issued loan guarantees or offered conditional commitments for loan guarantees totaling nearly $18 billion to support 20 clean energy projects.

Noise Control provides underwater noise services for hydrokinetic energy

Noise Control Engineering, Inc. (NCE) of Billerica, Massachusetts is excited to announce its participation in a hydrokinetic energy program with the company Free Flow Power of Boston, Massachusetts. Free Flow Power is working through the Federal Energy Regulatory Commission (FERC) for licensing deployment of hydrokinetic power generation through a series of projects in the Mississippi River.

NCE is tailoring its decades of underwater noise and vibration experience with ocean-going vessels and oil and gas industry projects to the engineering challenges presented by the burgeoning frontier of renewable energy development. It is involved with the prediction of underwater radiated noise from the hydrokinetic turbines as well as from local vessels and on-shore sources. NCE will also perform detailed underwater noise monitoring of the turbine field during operation.

For more information, visit www.noise-control.com.

Nova Scotia set to harness tidal power

The latest news came in February 2011 with the announcement that Atlantis Energy had won the fourth and final test bed in Nova Scotia's demonstration facility – part of the Fundy Ocean Research Centre for Energy (FORCE).

Officially founded in 2009, FORCE aims to take advantage of the enormous tidal potential available in the region.

Sandra Farwell of the Nova Scotia Department of Energy said that the project is "well underway. The Province has provided funding towards the projects, CAN$7 million in total, and the Central Government has provided CAN$20 million.

Every day, more than 100 billion tons of seawater flows into the Bay of Fundy – more than all the world's freshwater rivers combined. Early estimates suggest that the Minas Passage may be able to usably harness 300MW of electricity, while the Bay of Fundy as a whole could provide up to 8,000MW of installed capacity.

The first device to begin testing in Fundy was another 1MW undersea turbine developed by Irish company OpenHydro and deployed by Nova Scotia Power.

The most recent company to be awarded a site at the test bed – Atlantis Resources Corp. – will prototype a 1MW turbine that is fixed to the seabed. Each of these resembles a wind turbine, with the exception that there are two sets of three blades, each mounted back to back to harness the tides as they ebb and flow.

Atlantis, which will work with Lockheed Martin and Irving Shipbuilding in Nova Scotia to further develop its AK-1000 device, has already successfully prototyped smaller machines in Australia and is part of the MayGen consortium looking to exploit the tides of the Pentland Firth in Northern Scotland.

WindSentinel to use GL Garrad Hassan protocol

One of the major challenges in offshore wind resource assessment is gathering and validating data to support development of the wind turbines.

To date, developers have constructed meteorological masts to collect comprehensive wind data. These masts, however, are approximately 100m tall and typically cost around $5 million to design and install. Once construction approval is granted, a lengthy process itself, the mast can take about a year to build.

The WindSentinel™ offshore wind assessment buoy from AXYS Technologies costs substantially less, can be deployed within six months of purchase, and requires minimal regulatory approvals and minimal permitting. Once deployed, it can be moved to other locations, allowing significant flexibility in the data gathering process.

To support the data gathered using the WindSentinel™, one of AXYS' clients has turned to GL Garrad Hassan, recognized industry professionals in renewable energy consultancy, to develop a protocol that aims to validate the data they are gathering and ensure that the WindSentinel™ meets its objectives.

The WindSentinel™ uses a Vindicator® Laser Wind Sensor (LWS) as its primary wind assessment tool. The Vindicator®, developed by Catch the Wind, measures wind data using three pulsed lasers to obtain atmospheric measurements without the need for a traditional meteorological tower. As part of the process, Vindicator® measurements are evaluated against fixed reference measurements in a two-phase test campaign to demonstrate the accuracy of data and efficacy of the onboard motion compensation algorithms that mitigate the influence of the dynamic buoy motion on the readings.

Once consistency between the two sets of data has been established, the Vindicator® may be deployed in the desired assessment location.

For more information, visit www.axys-technologies.com.

ACORE releases updated state-by-state report on renewable energy for 2011

The American Council On Renewable Energy (ACORE) released the 2011 update and redesign of its report, Renewable Energy in America: Markets, Economic Development and Policy in the 50 States, as an online resource and a product of ACORE's mission to scale-up renewable energy in America. Compiling updated financial, market, resource potential, and policy information in a single easily-accessed resource, the report is intended to be an executive summary for those interested in the highlights of the renewable energy sector in every state.

"The U.S. is blessed with an abundance of domestic renewable energy resources, and the states, through effective policies and industry through investment and development, are leading the way in

harnessing these resources for productive use," says Todd Foley, Senior Vice President of Policy and Government Relations. "This report captures the highlights of an incredible scope of activity that is changing our energy future and paving the way for continued economic growth."

The report shows that in 2010, the total installed base of new renewable electricity exceeded 50GW in the United States.

The report may be accessed at www.acore.org/publications/50states.

Fugro GEOS plays vital role in two offshore wind projects

Collection of meteorological and oceanographic (metocean) data plays a vital role at different phases of offshore wind farm projects, ranging from early feasibility studies to engineering design and construction phases, as demonstrated by two recent contracts won by Fugro GEOS, for UK Round 2 and 3 projects.

Seagreen Wind Energy has recently awarded Fugro GEOS a contract for an oceanographic survey of the zone designated for the Firth of Forth Round 3 Offshore Wind Farm.

"We are very pleased to be working with Seagreen Wind Energy on this six-month study. The resulting data will be used for wind farm engineering design and included in the environmental impact assessment for proposed wind farm developments within the zone," explains Richard Liptrot, Fugro GEOS project manager. "The survey will include deployment of wave and current meters at locations throughout the zone over winter 2010/11." Survey results will also be utilized in the coastal processes assessment to be undertaken as part of the environmental impact assessment for the proposed wind farm developments within the zone.

Oceanographic instrumentation, including surface deployed wave buoys and a combination of bed-mounted acoustic Doppler current profiler (ADCP) current meters and acoustic wave and current meters (AWACs), will be deployed for one winter season from November 2010 to April 2011. The survey will also include measurement of suspended sediments. Water and sediment samples will be collected at the time each instrument is deployed, at service visits, and on recovery.

Marine and hydrokinetic energy legislation introduced in the Senate

Senator Lisa Murkowski (R-AK), Ranking Member on the Committee of Energy and Natural Resources, introduced S.630, the Marine and Hydrokinetic (MHK) Renewable Energy Promotion Act of 2011.

The MHK Renewable Energy Promotion Act of 2011 contains provisions of Section 474 of the American Clean Energy Leadership Act (S.1462), which was approved by the Committee on Energy and Natural Resources in 2009.

This legislation includes adaptive management grant provisions to provide a mechanism to collect and share environmental data, authorizes federal funding for three national MHK testing facilities, and establishes an energy device verification program. Furthermore, the legislation authorizes $75 million a year for three years (2012-2014) for MHK programs covered in the bill. The corresponding hydropower tax bill, S.631, includes 5-year depreciation language and full Protection Tax Credit (PTC) parity on par with other renewables.

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Adm. Zukunft testifies on Homeland Security
U.S. Coast Guard Assistant Commandant for Marine Safety, Security and Stewardship, Rear Adm. Paul Zukunft testified before the House Appropriation Subcommittee on Homeland Security about the Coast Guard's role in securing the U.S. Southwest border saying, "As the lead U.S. agency for maritime security, the U.S. Coast Guard employs a layered approach to Southwest border security, and we leverage international, interservice, interagency, and local partnerships to maximize our effectiveness. Our layer attack against threats to the homeland includes detection and interdiction in the departure and transit zones, in the approaches to Mexico, and in U.S. waters," said Zukunft. "Our unambiguous goal is to meet threats far from the U.S. border; the first layer of attack is at the source or in the transit zone where they are most vulnerable and before they arrive at our Southwest border."

The U.S. Navy awards contract for fourth Independence-Class Littoral Combat Ship (LCS 8)
This is the second ship awarded under Austal's recently announced U.S. Navy contract for construction of up to an additional 10 Littoral Combat Ships to be appropriated in the following five years, with a total value in excess of USD$3.5 billion. Once commissioned, these 10 ships will join the Austal-built USS Independence (LCS 2), which was commissioned in January 2010. This 10-ship contract will require Austal to more than double its U.S. workforce to approximately 3,800 employees in order to fulfill the contracts currently awarded. Construction of LCS 8 will commence in January 2012 at Austal's shipyard in Mobile, Alabama. For the LCS and JHSV programs, Austal is teamed with General Dynamics Advanced Information Systems, a business unit of General Dynamics. General Dynamics is the ship systems integrator, responsible for the design, integration, and testing of the ship's mission systems.

Northrop Grumman to supply navigation systems for Canadian patrol vessels
Northrop Grumman Corporation has been selected to supply bridge navigation systems for nine new mid-shore patrol vessels to be built for the Canadian Coast Guard. The contract, valued at up to $3 million, was awarded to Northrop Grumman's Sperry Marine business unit in Canada through its dealer, Techsol Inc., based in Quebec City. Six of the initial nine ships have been delivered, with the remaining deliveries scheduled for June 2011. The contract includes options for up to three additional ships.

South Korea launches third destroyer
South Korea launched its third destroyer equipped with the high-tech Aegis radar and weapons control system as tension remains high on the Korean peninsula. The 7,600-ton KDX-III destroyer, Seoae Ryu Seong-ryong, can carry about 120 missiles and torpedoes in its vertical launch system.

MARINS INS selected for UK Royal Navy's fourth Astute-class submarine—HMS Audacious

After an exhaustive assessment, BAE Systems (Submarine Solutions) has chosen iXSea MARINS inertial navigation systems for HMS Audacious, the fourth boat in the UK Royal Navy's Astute-class, nuclear-powered attack submarine construction programme. HMS Audacious will be equipped with two MARINS units. iXBlue will also supply a third unit for preliminary test work at BAE Systems' Astute Shore Integration Facility and provide engineering and project management support for the installation of the units onboard the submarine. BAE Systems has options on further MARINS units for Astute-class boats five, six, and seven.

MARINS was designed by iXSea to meet the growing need of the world's navies for more accurate and reliable inertial navigation systems and represents the state-of-the-art strapdown, fiber-optic gyroscope technology. The military-specification unit outputs position, heading, roll, pitch, depth and velocities and is perfectly silent. Drift is less than 1-Nm in 24 hours operating in pure inertial mode, (i.e., without GPS input). It is compatible with a wide range of aiding sensors and can be up and running within minutes.

A spokesperson for BAE Systems said that the choice of the MARINS system was "in response to the UK Ministry of Defense's challenge to provide a more affordable submarine and combat system." The spokesperson added: "A design-for-cost-reduction program resulted in several initiatives being identified that challenged the existing design requirements to provide a more affordable combat system. The selection of the MARINS inertial navigation system was based on its overall performance, reliability, and through-life cost benefits. MARINS will provide a vital element of the combat and navigation system of the fourth Astute-class boat."

The MARINS units for HMS Audacious are virtually commercial-off-the-shelf (COTS), though some modifications have been made to accommodate specific operational requirements.

For more information, visit www.ixsea.com.

Bluefin Robotics awarded $30M Hull Unmanned Underwater Vehicle Localization System (HULS) production option

Bluefin Robotics, a leader in the design and manufacturing of Autonomous Underwater Vehicles (AUVs), is being awarded a $30 million contract modification to exercise Option III for the Explosive Ordnance Disposal Hull Unmanned Underwater Vehicle Localization Systems (HULS) production systems. The HULS production systems support Naval forces in conducting hull, piers, and pilings searches. The contract was structured in three phases or options: demonstration, prototype, and production of the HULS systems. The Naval Surface Warfare Center, Indian Head, Maryland, is the contracting activity.

The program objective is to deliver a small and relatively low-cost autonomous vehicle capable of precision maneuvering, with a focus on ship hull inspection. The requirement to inspect ships' hulls has long been one of the most manpower intensive and time-consuming tasks that divers must routinely perform, for both security and husbandry purposes. With increasing demands on some of the Navy's diving community that are qualified Explosive Ordnance Disposal personnel, the mission of hull searches has emerged as an ideal application for unmanned systems.

For more information, visit www.bluefinrobotics.com.

SeeByte announces sale to Defense Research and Development Canada

SeeByte, the global leader in creating smart software technology for unmanned systems, is pleased to announce their most recent sale of SeeTrack Military to Defense Research and Development Canada (DRDC), the Canadian Forces' science and technology agency.

DRDC purchased the SeeTrack Military licence together with SeeByte's Performance Analysis & Training Tool (PATT) to help develop Automatic Target Recognition (ATR) algorithms for the Canadian Navy. Improved ATR will assist in one of the key challenges facing naval Mine Counter Measures (MCM): the ability to detect and classify objects, generating fewer false alarms and improving the value of data gathered. SeeTrack Military will provide DRDC with a tool for tactical system mission planning, asset tracking, data analysis, and object correlation. PATT provides a platform on which they can analyze the performance of their ATR algorithms.

For more information, visit www.seebyte.com.

Editorial Focus

Technology Trends in the Offshore Oil & Gas Industry

ROV Sensors & Subsystems

By Chuck Richards

The offshore oil and gas industry has always been innovative – developing techniques and technologies to explore and produce oil and gas in increasingly deeper water. When I began my career in this industry in 1975, 1,000 feet was considered the ultimate depth limit because that was the deepest divers could safely work. Then in 1976, ROVs were introduced, and they became a game changer. In 1976, several new dynamic positioned drilling rigs were ordered from shipyards that could drill in 3,000 feet of water. Currently 12,000 feet is the deepest rating of any existing drillship, but it is only a matter of time before that will increase.

Last year's Macondo blow out and subsequent drilling moratorium have negatively affected the industry in the Gulf of Mexico. Many of the assets that were active in the Gulf prior to Macondo have moved to other offshore hot spots, including Brazil, West Africa, Southeast Asia, and Australia. Economics will dictate when and if they return. Recently, permits have begun to be issued, and by the end of the year, the Gulf of Mexico should be quite active. But things will not be back to "normal." New regulations require operators invest in additional safety systems for vessels and subsea hardware, and they must have contingency equipment in place and ready to deploy in the event of another incident.

Innovation, however, is alive and well. New developments in ROV sensors and subsystems and subsea control and communication systems are being developed and, in some cases, implemented. While this article is about new emerging technology, none will be implemented if it does not reduce cost and increase reliability. Vessel time is one of the largest costs in any offshore project, so anything that can be done to reduce vessel time will benefit the project.

Recent ROV Developments

ROV pilots will tell you that over 90% of their work is observation of subsea activities, so why not have the very best video system available? While many of us have enjoyed HDTV in our homes for years, its use subsea has been limited. The high bandwidth requirements of transmitting, displaying, and recording HD are the biggest impediments.

The typical Standard Definition (SD) Color Zoom camera found on the front of most ROVs today produces excellent video, but it has not seen a significant improvement in over 10 years. Because the new HD cameras are similar in size to existing SD cameras, usually no change is required to the camera mounting on an ROV; but HD transmits approximately 6 times the bandwidth of the standard video signal, therefore, upgrades to the ROV's telemetry, display, and recording systems are required.

Up until recently, the cost of these upgrades and the complexity of software-based recording systems have kept HD out of the mainstream. But, recent introduction of HD-SDI cameras with fiber optic or coax outputs and commercially available HD-SDI to HDMI converters allow the use of less expensive HD display and recording systems so that HD upgrades for most Work Class and Observation Class ROVs becomes a much simpler issue. Also, software systems for recording HD and other sensors on the ROV have been simplified for easier operator use. HD will become the standard camera on all Work and Observation Class ROVs in the near future.

Significant advances have been made in low-light-level ROV vision systems, with the recent release of the so-called BIT Camera (Back-Illuminated and Thinned). It was not long ago that every Work Class ROV carried a SIT camera (Silicon Intensifier Target) to facilitate viewing in very turbid water. These cameras had excellent light sensitivity that peaked in the blue-green region of the light spectrum, therefore, they worked extremely well in seawater with very little light. SIT tubes became unobtainable with the advent of smaller, less expensive low-light sensitive CCD devices that peak in the near infrared range. The largest market for SIT tubes was not subsea; it was for night vision devices primarily used by the military. Since these were being used in air not subsea, sensitivity peaking in the infrared range was desirable, but under water, infrared is highly attenuated, therefore, they do not work near as well underwater as SITs. A BIT camera's sensitivity is fairly broad across the light spectrum and is very high in the blue-green region of seawater; therefore, it is very suitable for low-light situations underwater.

3-D video is making a come back. The first commercially available subsea 3-D video systems were introduced in the late 1970s but never really gained much more than passing interest due to their cost, size, and performance. They used two vidicon tube cameras, which were the standard of the day, and two Cathode Ray Tubes (CRT) displays with polarized lenses, so that they could be viewed with simple polarized glasses. But ROVs in that day and time were not required to do very complex manipulative tasks, which is where 3-D really pays off. Anyone who watched the live ROV feed from the Macondo blowout knows that today's ROVs are required to do much more intricate manipulative work and, in many cases, time is of the essence. With the current camera and display technology, I believe 3-D will become much more common on ROVs.

ROV DP (Dynamic Positioning) is becoming a common feature on many Work Class ROVs utilizing DVLs (Doppler Velocity Logs) to measure ROV motion and speed, a depth sensor, and a Gyro Compass for heading. DP allows an ROV to maintain position, run pre-established survey lines, and auto hover. Maintaining position is particularly useful when performing manipulator tasks. It also helps less experienced pilots perform subsea tasks more efficiently with less potential damage to the ROV from collisions. Even seasoned pilots find using it reduces fatigue. ROV DP is offered as an option on many new

ROVs and one company is offering ROV DP systems that can be retrofitted to any existing Work or Observation Class ROV.

Every Work and Observation Class ROV has a single beam imaging sonar to give the pilot a long range (100 – 200 meters) view of what lies ahead. These systems have been available since the early 1980's and they work very well. Their ability to produce very high resolution images and their relatively low cost have made them indispensable. Their biggest drawback is that to produce those excellent images, the ROV must be stationary. Any movement will cause distortion of the image.

Today, Multibeam sonars are being installed on more and more ROV's. Their ability to give pilots up to 100 meter forward view of the ROV, updated several times a second, makes this a particularly useful tool for navigating ROV's. Very recently multibeams have been introduced that can image objects as close as 8 – 10 inches all the way out to 100 meters. The short range capability can be used to perform manipulator tasks in zero visibility. The small size, lower cost, power requirements and telemetry of these sonars allow for installation on virtually any Work Class or Observation Class ROV.

You would be hard pressed to enter a hardware store today to buy a typical flashlight (torch) that does not come with LED (Light Emitting Diode) lights. The same can be said of ROV lighting. LED lighting's advantages over conventional incandescent or gas discharge lighting are numerous and include greater ruggedness, brightness, brightness control, color quality, and power efficiency. LED lights are less expensive than HID (High Intensity Discharge) lighting and there are no expensive bulbs to replace.

Underwater Positioning, Communications and Control

Acoustic positioning systems are available today that utilize spread spectrum signal technology. Advantages over traditional acoustics include increased accuracy, longer range, reduced multi path, and increased telemetry data rates. Because acoustic signals travel long distances in water, it makes them very useful for control of subsea devices, such as backup control of BOPs (Blow Out Preventers), but their data rate is limited (10kbits/sec). For short range underwater communications, RF (Radio Frequency) can transfer data at up to 100kbits/second. ROV-mounted RF units can be deployed to subsea fields that have RF equipped control systems where they can monitor sensors and control functions such as opening or closing valves. Utilizing new non-contact inductive coupling technology, the ROV can even recharge battery packs, all while in close proximity to the subsea device with which it is communicating.

Complex vessel-to-vessel communication has emerged in the wake of Macondo where as many as 17 DP vessels were working in very close proximity to each other. A mesh network capable of connecting all vessels within vicinity (10-mile range) make it possible to share data and high quality video and offer VoIP. Rather than each vessel having to rely on individual satellite links, they can communicate with all vessels in the network and have a single satellite link or, if available, a fiber optic link from a nearby platform, backhauling data back to shore.

All of these technologies, gizmos and widgets will never find use offshore if they don't help accomplish their task more efficiently, with high reliability, and most importantly, safely.

Editorial Focus

Technology Trends in the Offshore Oil & Gas Industry

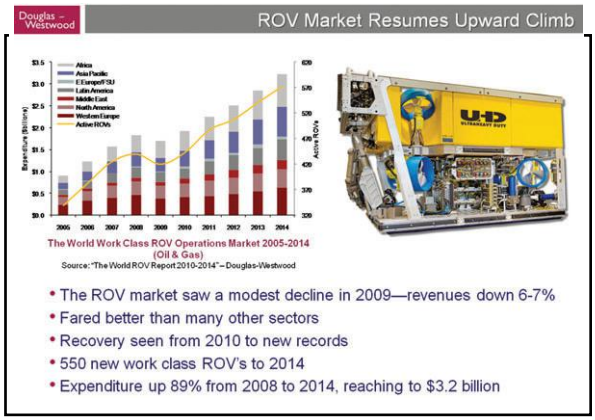
The Emerging Services Market

By Dan White

Uncertainties in the Middle East, Gulf of Mexico, and West Africa are making Brazil more attractive to O&G investors. This is true for all areas of the O&G industry and definitely highlights the importance of Brazil's pre-salt E&P. The recent unrest experienced in Bahrain in the Middle East, the ongoing civil war in Libya, rampant attacks on oilfields in Nigeria, and uncertainties in other West Africa countries on top of the drilling moratorium at the Gulf of Mexico may have a substantial influence in O&G-related investments being increasingly channeled to Brazil.

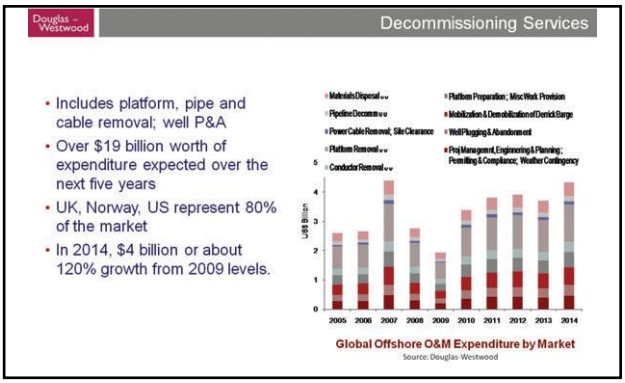
But markets such as ROVs/AUVs, decommissioning, and Inspection, Repair, and Maintenance (IRM) are poised to explode.

Market analysts at MarketResearch.com are seeing a profound movement towards deep sea development. ROVs and AUVs are a vital component of subsea work, especially where great depths and extreme environments create challenging conditions. Based on their research, the global ROV and AUV market in the energy sector was worth $1.27 billion in 2010.



Douglas Westwood Associates forecast that 550 new ROVs will be built by 2014 relating to an increase in ROV services.

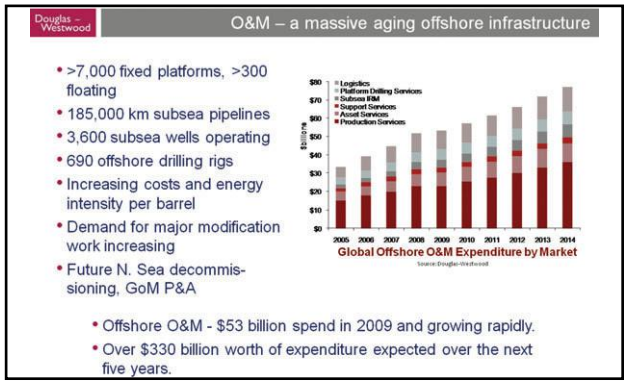
In the emerging decommissioning market, Douglas Westwood forecasts that over $19 billion will be spent on platform, pipe and cable removal, and well plugging and abandonment over the next five years.



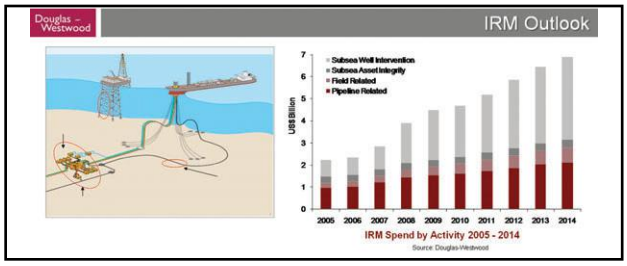
Large equipment such as Versabars VB 10,000 (cover photo) and their Deck Salvage System will be essential to this market. The versatile Deck Salvage System has recovered over 60,000 tons of debris from the Gulf of Mexico over the past four years.

Versabar's Deck Salvage System transports a 2,500-ton jacket to a permanent reefing site in the Gulf of Mexico (top). The same system is seen bringing a storm-sunk 1,050-ton production platform to the surface (right).

Today, the Operations & Maintenance (O&M) and IRM markets are growing at an impressive rate. Douglas Westwood, forecasted in late 2009 an offshore operations and maintenance expenditure of more than $330 billion over the next five years — with the largest share allocated to North America during that time.



They also predict the IRM market will grow more than 10% between 2010 and 2015. The forecasters claim that the stock of subsea completed wells and pipelines are expected to grow substantially over the next five years—and all this equipment will require significant levels of ongoing inspection, repair and maintenance work.



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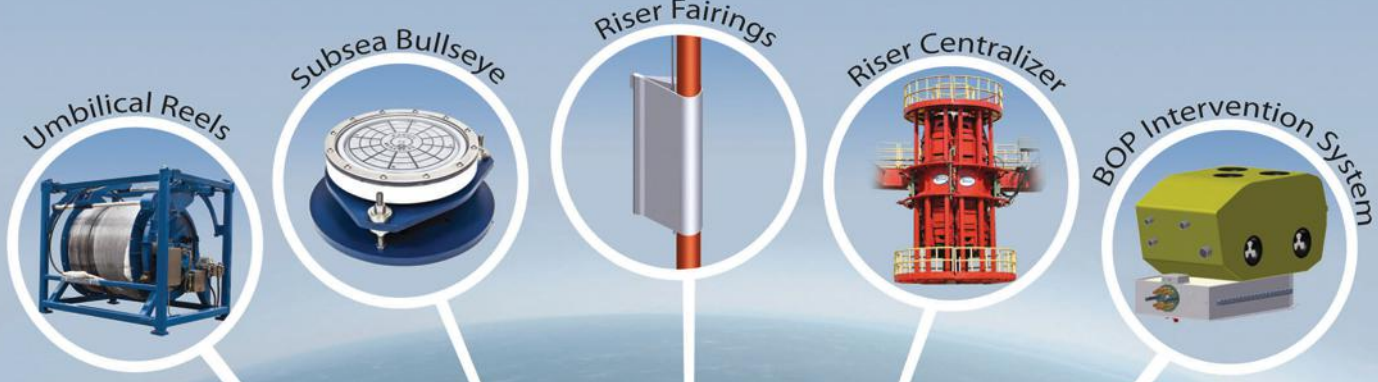

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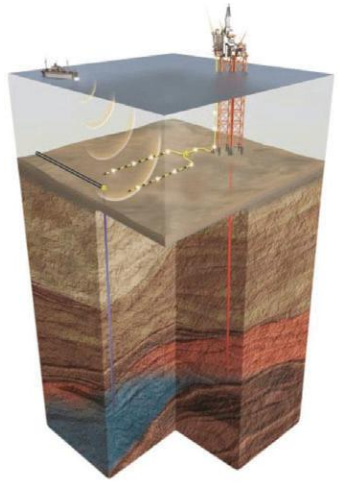
OFFSHORE INDUSTRY

Hydrocarbon recovery gets boost from seabed sensor

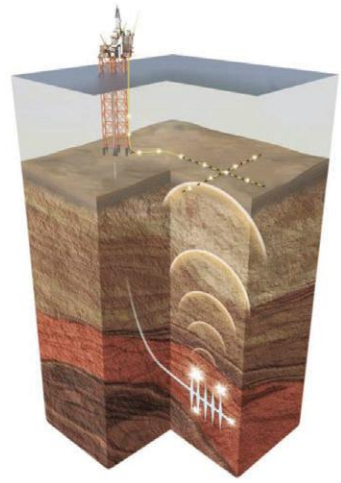
By permanently installing a small, highly sensitive, broadband, multi-component seismic sensing array called FosarFocus 4C on the seabed over a target area, high dynamic range active and passive time-lapse data can be acquired, enabling optimized production and hydrocarbon recovery through improved reservoir management decision making, according to the system's designer, Stingray Geophysical Ltd.

A leader in seismic permanent reservoir monitoring (PRM) solutions to the upstream oil and gas industry, Stingray recently launched the modular, fiber-optic FosarFocus system to provide operators with a cost-effective and reliable solution to targeted well zone monitoring requirements such as flood front and fracture monitoring.

For flood front monitoring applications, a FosarFocus array is installed between injector and producer wells. Frequent repeat seismic surveys provide intra-well reservoir time-lapse signals for dynamic reservoir model updates. These updates provide critical information on the location of the fluid front, pressure distribution, and flow barriers or thief zones between injector and producer wells. In addition, time-lapse seismic provides dynamic information that can be used to identify which well zones are producing effectively and when and where remedial action may be required.



Flood front monitoring using a fiber-optic FosarFocus seismic sensing array.



Fracture monitoring using a fiber-optic FosarFocus seismic sensing array

For fracture monitoring applications, the FosarFocus system is deployed in a cross or star pattern above the zone being stimulated. Micro-seismic events associated with reservoir stimulation and detected by the array are transmitted to a data center for processing and updating of the reservoir model.

By providing the stimulated fracture geometry, azimuth, connectivity, and density, micro-seismic monitoring allows optimization of the hydraulic fracture operation, enabling faster hydrocarbon recovery and lower drilling and completion costs over the life of a field. To facilitate optimal fracture operation planning, an active seismic survey provides pre- and post-stimulation information on the reservoir fracture network and stress field.

"Real-time data is of great value to oil companies seeking to make production management decisions on, for example, changes to pump pressure or rate, or the proppant mesh or modifications to well and completion design," said Martin Bett, Stingray's chief executive officer.

For additional information visit www.stingraygeo.com.

Buckled drill pipe caused well's blowout preventer to fail: study

The blowout preventer that should have stopped the massive BP oil spill off Louisiana failed largely because a trapped piece of pipe prevented the BOP's blind shear rams from sealing the well around the time of the April 20 oil rig explosion, according the government's final examination of the device, released March 23.

The 551-page investigative report said the drill pipe's position within the wellbore caused it to buckle and bow when the well lost control, impeding the rams. The shear rams are components in a blowout preventer that cut, or shear, through drill pipe and form a seal against well pressure.

Det Norske Veritas, the Norwegian firm hired by the government to test the 300-ton blowout preventer, also questioned the performance and design of the failsafe device.

Driller Transocean may attempt to recover sunken Deepwater Horizon

Transocean Ltd., the world's largest offshore oil driller, may attempt to recover some or all of the Deepwater Horizon rig that exploded and sank during last year's Macondo well disaster.

The wreckage, about a mile beneath the surface of the Gulf of Mexico, was surveyed in response to a Dec. 6 request from the U.S. Coast Guard to remove diesel fuel that remains trapped in tanks aboard the rig, Transocean said in a public filing.

The company is reviewing the results of the survey and has a $140 million wreck-removal insurance policy to cover the costs, according to the filing.

BP Plc's Macondo well erupted in April, killing 11 rig workers, injuring 17 and triggering the most-extensive offshore crude spill in U.S. history. BP was leasing the vessel from Vernier, Switzerland-based Transocean for about $500,000 a day at the time of the catastrophe.

Alaska OCS could become 8th largest oil resource in the world

A new study says drilling on Alaska's Outer Continental Shelf (OCS) could make Alaska the eighth largest oil resource province in the world -- ahead of Nigeria, Libya, Russia, and Norway.

The report, by the consulting firm Northern Economics and the University of Alaska-Anchorage's Institute of Social and Economic Research, says that developing Alaska's OCS could produce almost 10 billion barrels of oil and 15 trillion cubic feet of natural gas, create around 55,000 new jobs, and produce $145 billion in new payroll nationally, generating a total of $193 billion in government revenue through the year 2057.

Currently, the U.S. imports over 60% of its crude oil, according to the American Petroleum Institute. The study estimates that Arctic offshore development could cut U.S. imports by about 9% over 35 years.

Subsea equipment capex to increase to $139 billion

Douglas-Westwood predicts a 23% growth in subsea hardware capital expenditures to $139 billion in 2011-2015, compared to the prior five-year period. In its first "World Subsea Hardware Market Report," the analysts said the challenge of reaching new reserves is a driver. Others include deeper water developments, more remote locations, and metocean extremes.

Higher oil prices and advancing technology make viable smaller, more widely scattered developments, all of which mitigate in favor of subsea production. Subsea pipeline spending will account for more than half the capex, said the report. The so-called "Golden Triangle" of West Africa, the Gulf of Mexico, and Brazil will account for more than 60% of all subsea production, SURF, and processing hardware spend over the forecast years.

Offshore royalties to rise 68% to $5.97 billion under 2012 budget

U.S. offshore royalties paid by oil and gas firms for offshore production is expected to increase by 68% under the 2012 budget. The United States will receive $5.97 billion from royalties in the fiscal year starting October 1, 2011 against $3.56 billion in 2010.

The government plans to charge oil firms for drilling permits and inspection operations on federal lands and waters in order to increase funding to cover energy oversights following the BP oil spill in April 2010. The budget also suggests an increase in inspection fees to $65 million in 2012 from $10 million in 2010 because of increases in the cost of enforcing new environmental and safety regulations.

Global Industries awarded multiple decommissioning projects in GoM

Global Industries, Ltd. has been awarded multiple projects by McMoRan Oil & Gas for the decommissioning and abandonment of seven production platforms located in the Central Gulf of Mexico in water depths ranging from 100 to 400 feet. The decommissioning campaign was scheduled to commence in late April 2011 and has a projected duration of 90 to 100 days.

For execution of the project, Global will be using the DLB Hercules, a DP-2 equipped vessel (photo) with a crane capable of lifting 2,000 tons. The 485-foot, Hercules accommodates 269 personnel, and will be carrying out decommissioning and abandonment activities, which includes 14 major lifts up to 1,500 tons.

BOEMRE approves Shell deepwater exploration plan for Gulf of Mexico

U.S. federal regulators have approved a deepwater Gulf of Mexico drilling plan submitted by Shell, marking the first new drill plan to be approved since the BP Macondo blowout and spill last year.

However, Shell had to submit applications for permits to drill those wells.

The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) said the plan passed new rigorous safety requirements as well as an environmental analysis. At the time of the Shell approval, there were 13 deepwater exploration plans pending, BOEMRE said.

The supplemental exploration plan includes three proposed new wells that were not included in the original plan submitted for Shell's Auger Field in 1985. Shell is proposing to drill three new exploratory wells in approximately 2,950 feet of water, 130 miles offshore Louisiana.

BOEMRE said that it found no new evidence that Shell's proposed plans "significantly affect the quality of the human environment." Therefore a lengthy environmental impact statement is not necessary, the agency said.

Petrobras CEO José Sergio Gabrielli de Azevedo captures top award

José Sergio Gabrielli de Azevedo, chief executive officer of Petróleo Brasileiro S.A. (Petrobras), has earned the distinction of his peers — leaders of many of the world's 100 largest oil companies — as the 2011 Petroleum Executive of the Year, announced Energy Intelligence (EI), a global information provider of industry publications, analytics and research.

"This selection reflects Mr. Gabrielli's success in leading Petrobras during a period of enormous growth that's seen it become the second largest oil company in the world by market capitalization and encompassed the discovery of vast deep water oil and gas reserves in the subsalt area in the South Atlantic — the most important new petroleum province of the last 10 years," noted Thomas Wallin, president of EI.

José Sergio Gabrielli de Azevedo

The Petroleum Executive of the Year selection process begins with Energy Intelligence eliciting nominations from the heads of the 100 largest oil companies determined by The Energy Intelligence Top 100: Ranking The World's Oil Companies, an EI publication. These nominations are then voted on by a committee of previous award winners and former senior oil executives.

Brazil's Petrobras free to use FPSO at Chinook-Cascade in U.S. Gulf

The U.S. Interior Department has given final approval for Petrobras to use the first ever deepwater floating production storage facility in the U.S. Gulf of Mexico.

The facility will be used when the company begins oil and natural gas production at its Chinook-Cascade project in the near future, the Department said. Petrobras is based in Brazil. The floating facility has a daily production capacity of 80,000 barrels of oil and 16 million cubic feet of gas. It can be disconnected and moved in the event of a hurricane or tropical storm, preventing a long-term disruption in supply due to a major storm.

B.W. Pioneer

"These regulatory approvals pave the way for safe, new production of oil and gas resources in the Gulf of Mexico," said Michael Bromwich, who heads the Department"s agency that oversees offshore drilling.

Petrobras' Cascade-Chinook project is located 165 miles off the Louisiana coastline in 8,200 feet of water. The project will use the floating B.W. Pioneer vessel, which will process the oil and gas, store the oil in onboard tanks, and offload it on to shuttle tankers that will take the oil to shore. Natural gas processed by the facility will be moved to shore by a pipeline.

The B.W. Pioneer is one of 16 floating production and storage vessels owned by BW Offshore, which provides floating production facilities to the oil and gas industry.

Reservoir Group joins forces with Houston's Mudlogging Company

Oil and gas services company Reservoir Group (RG) expanded its operations in the United States and entered a new industry sector after joining forces with The Mudlogging Company(TMC), a Houston, Texas-based company specializing in surface logging services.

The alliance, which represents the second North America investment that RG has made in as many months, will complement the Group's international success as a business focused on niche activities for the hydrocarbon reservoir, including the downhole drilling, completion and production sectors. RG has more than doubled in size since its inception in 2007, despite adverse market conditions.

The TMC, which has been in business for nearly 25 years, has built a strong industry reputation as a leading provider of surface logging operations in the U.S. Gulf Coast and surrounding regions, both onshore and offshore, through its proprietary software and exclusive technology.

Surface logging is a formation evaluation service conducted through the continuous wellsite analysis of fluids and rock cuttings. It allows the identification of hydrocarbon zones and other geological features while a well is being drilled.

Shell signs up Noble Jim Day for deepwater work in Gulf of Mexico

Offshore drilling contractor Noble Corp. secured a letter of intent with a subsidiary of Royal Dutch Shell plc for the 12,000-foot ultra-deepwater semi-submersible Noble Jim Day (photo) to operate in the U.S. Gulf of Mexico. Under the terms contemplated by the letter, effective dates and rig rates would vary.

The agreement contemplates that Noble would receive a standby rate if Shell is unable to secure drilling permits as follows: from Febuary 15, 2011 through May 31, 2011, $156,000 per day and from June 1, through July 31, 2011, $242,000 per day. Beginning August 1, 2011 or Shell securing a drilling permit for use of the unit, the operating dayrate would be $485,000 per day. During the operating period, the unit would be eligible for a performance bonus of up to 15% of the dayrate.

"This is an extremely high-quality rig, and there was significant customer interest. However, other opportunities that would have required a mobilization out of the U.S. Gulf would have precluded us from being able to begin recognizing revenue until much later in the year," said David W. Williams, Noble's chief executive officer.

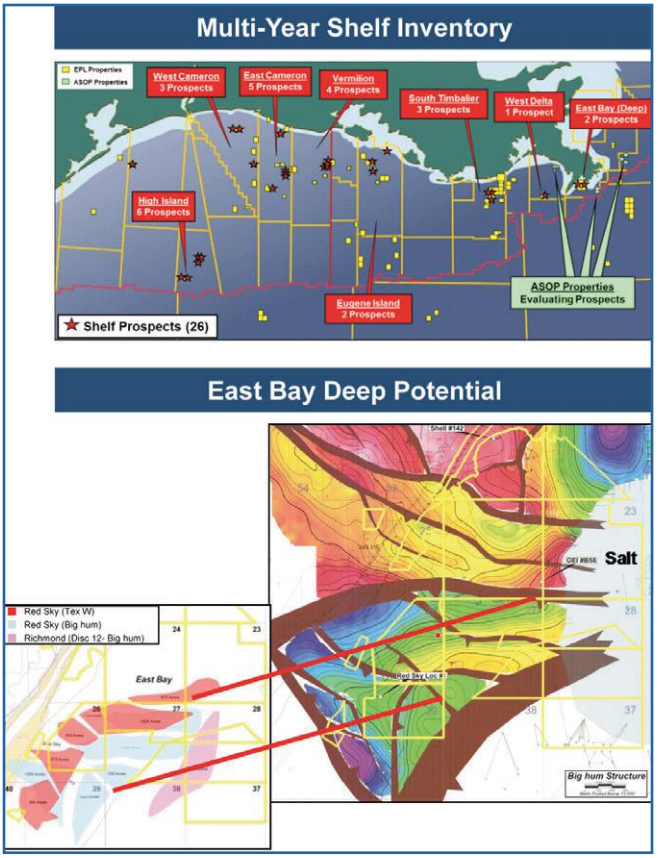
McDermott wins over $700 million in contracts
McDermott International, Inc. subsidiaries in the Middle East and Caspian region were recently awarded contracts for offshore engineering and construction projects ranging from installation through to full EPCI work, as part of McDermott's $2 billion of fourth quarter bookings. The contracts in the Arabian Gulf, Indian Ocean, and Caspian Sea are included in McDermott's fourth quarter 2010 backlog and have a combined value in excess of $700 million. The turnkey EPCI award is for a number of platforms and subsea facilities in the Arabian Gulf as well as for modifications to existing infrastructure and more than 100km of rigid and flexible pipelines and cables. Structures will be built at McDermott's Jebel Ali fabrication facility in the United Arab Emirates, and crews of McDermott's DB27, the newly built pipelay barge LB32 and in-house dive support vessels are expected to support the installation scope.

InterMoor to replace Auger TLP platform wires
Shell Exploration & Production Co. has contracted InterMoor to replace the platform wires on the Auger TLP's lateral mooring system. Auger is in the Gulf of Mexico. The project involves replacement of eight non-jacketed, spiral-strand wires. InterMoor also will do the project management, engineering, and fabrication of installation aids, including a hang-off porch for the stern of the installation vessel. Work is scheduled for completion in May.

Subsea 7 wins EPIC contract for Ensign Project
Centrica Energy Upstream has awarded Subsea 7 an engineering, procurement, installation, and commissioning (EPIC) contract from for the flowlines and subsea works on the Ensign Project off the UK. The Ensign Project is situated around 18 km northwest of the Audrey "A" platform over blocks 48/14 and 48/15 of the UK sector of the North Sea. Subsea will engineer, procure, install, tie-in and pre-commission 24km of 10-in. gas and 2-in. methanol pipelines to connect the Ensign satellite platform with the existing subsea pipelines at the Audrey "A" platform. The firm will also conduct EPIC for 2 kilometers of 10-inch gas pipeline and associated control umbilical connecting the Ensign platform to a new subsea well.

FMC receives $125 million order from Petrobras
FMC Technologies received a $125 million order from Petrobras, Brazil's national oil company, to supply equipment for use in its oil and gas developments offshore Brazil. The order, for 32 subsea trees, represents the remaining equipment under a 107-tree frame agreement that was announced in Febuary 2010. Equipment deliveries are scheduled to begin in 2013. FMC has supplied Petrobras for decades, delivering over 300 subsea trees for its projects in Brazil. "Today's announcement, as well as our recent investments in a Technology Center and other facility expansions in Brazil, strengthens our support of Petrobras and their offshore programs," FMC chief executive John Gremp said.

EPL, Phoenix target moderate depths at GoM's East Bay field



Energy Partners Ltd., New Orleans, and Phoenix Exploration Co. LP, Houston, will explore moderate depths below production at the giant East Bay area on South Pass blocks 24, 26, and 27 off Louisiana. The East Bay area is nearly all in State waters where the State offers severance tax suspension on wells at 15,000 feet or more of true vertical depth. East Bay, in shallow water 90 miles southeast of New Orleans, is the sixth largest field on the Gulf of Mexico shelf in terms of cumulative production. Technical teams from both firms will use EPL's 223 square miles of newly reprocessed seismic data to generate Miocene prospects at 14,000 to 20,000 feet that can be drilled for $12 to $20 million.

The companies don't plan to pursue perceived potential in Lower Miocene, Oligocene, and Eocene at costlier ultra-deep depths. First drilling could occur in late 2011. The agreement provides for EPL to farm out acreage at East Bay, with a promoted overriding royalty interest in favor of EPL on interest Phoenix earns in successful prospect areas. EPL retained the right to participate up to a 50% working interest in each prospect area.

EPL said it chose Phoenix over others because of its "expertise and excellent track record exploring similar plays in this region. By leveraging our respective skill-sets, the agreement allows us to more efficiently generate and drill high-impact prospects below our existing shallow productive horizons." The moderate depths offer "high-potential resources on the Gulf of Mexico shelf for shallow water costs" at compelling risk-reward, EPL said.

Subsea 7 awarded Phase 2 contract for Chevron's Tahiti project in GoM

Chevron Corp. contracted Subsea 7 SA for the engineering and installation of the Tahiti Phase 2 development in about 4,000 feet of water in the Gulf of Mexico, about 190 miles south of New Orleans.

Subsea 7's workscope includes the installation of one 7.5-in. by 13,000 feet of flexible riser, one 4-in. by 4,500 feet of long umbilical, five rigid well jumpers, 10 electrical flying leads, and seven steel flying leads.

It also will transport the flexible riser from Le Trait, France to the Gulf of Mexico and commence immediately the engineering work at its Houston office. Plans are to install the flexible riser and umbilical in third-quarter 2011 and tie in five wells through mid-2012.

For the installation work, Subsea 7 will use the Seven Oceans (pipelay) Skandi Neptune (construction/flexlay), and the Ross Candies (light construction-installation, maintenance, repair) vessels.

Chevron began production from the Tahiti spar in May 2009. The field lies in Green Canyon Blocks 596, 597, 640, and 641. Chevron is the operator of Tahiti and holds a 58% interest. Its partners are Statoil Gulf of Mexico LLC (25%) and Total E&P USA Inc. (17%).

Wood Group's J P Kenny to provide design for Jack-St. Malo pipeline

Wood Group's J P Kenny has been awarded a contract to perform detailed design for Amberjack Pipeline Co. LLC's Jack-St. Malo deepwater oil export pipeline in the Gulf of Mexico.

Amberjack Pipeline is a joint venture between Chevron Pipe Line Co. and Shell Pipeline Co. LP. Chevron Pipe Line will construct and operate this pipeline for Amberjack. The one-year contract follows J P Kenny's successful completion of the front-end engineering and design for the project.

The approximately 136-mi. 24-in. pipeline will originate in a water depth of 7,000 feet. It will start at the Chevron USA. Inc.-operated Jack-St. Malo hub production facility in Walker Ridge Block 718, about 280 miles south of New Orleans and connect to the Shell Boxer "A" fixed platform at Green Canyon Block 19.

The design must allow for technical challenges that include routing of the pipeline to minimize spans, design for pre- and post-installation vortex-induced vibration and stress spans, collapse testing of the pipe to verify wall thickness design, and installation of in-line valves and sleds.

J P Kenny's sister companies, MCS Kenny, MSi Kenny, and Wood Group Integrity Management (WGIM), will support the project, providing subsea span analysis, flow assurance and materials engineering, respectively.

Cobalt exploration plan okayed for Garden Banks Platte No. 1 well

Cobalt International Energy, Inc. received a letter from the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), notifying Cobalt of the its approval of the company's exploration plan for Garden Banks Block 959, which Cobalt refers to as the North Platte No. 1 exploratory well. Although the approval is an important step in the well permitting process, Cobalt said it was uncertain as to when it would be able to actually resume drilling operations on the North Platte #1.

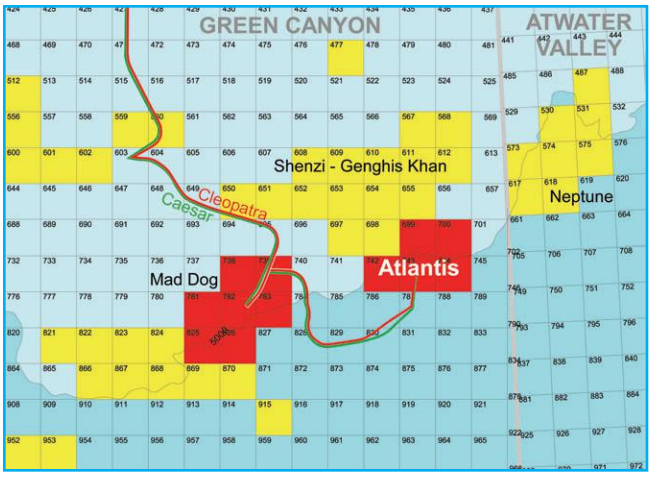
BP's Atlantis platform is no safety risk: feds

U.S. investigators said problems with engineering documents on a BP production platform in the Gulf of Mexico didn't pose a safety risk and that the company wouldn't face civil penalties. The findings marked the end of an investigation that stemmed from an April 2009 suit in which a BP contractor alleged the company couldn't safely operate its Atlantis platform because it didn't have thousands of necessary engineering documents. Investigators said that while BP labeled the engineering documents in a "confusing" way and some documents were missing required stamps and signatures, those conditions didn't create "specific unsafe conditions" on the platform. They said personnel on the rig had access to relevant safety information.

BP corrected the infraction shortly after a non-compliance notice was issued. The Department said allegations that BP made false submissions to the government were also "unfounded."

The investigation included interviews of 29 individuals, analysis of more than 3,400 engineering drawings and related documents, and review of hundreds of additional documents.

"Although we found significant problems with the way BP labeled and maintained its engineering drawings and related documents, we found the most serious allegations to be without merit," Michael Bromwich, head of the U.S. Bureau of Ocean Energy Management, said in a statement.



Atlantis is among the largest oil field in the U.S. Gulf, with an estimated 600 million barrels of reserves. It is located at Green Canyon blocks 699, 700, 742, 743, and 744, about 130 miles from the coast of Louisiana. The field lays in water depths ranging from 4,400 to 7,100 feet. Atlantis was discovered in 1998 by the Ocean America semi-submersible mobile drilling rig operating in a water depth of 6,140 feet.

The discovery was later confirmed by wells drilled by GSF C.R. Luigs and Glomar Explorer. Production started in October 2007. Atlantis can produce up to 200,000 barrels per day of oil, around 13% of total U.S. Gulf output, and up to 180 million cubic feet of natural gas daily.

Oil and gas trade group attempts to block giant polar bear habitat

The Alaska Oil and Gas Association (AOGA), a petroleum industry trade group, sued the federal government over its designation of 187,157 square miles as polar bear critical habitat, claiming it covers too much territory and could cost tens of millions or more in economic effects, Associated Press reported in early March.

"This is an area larger than 48 of the 50 states, exceeding the size of the State of California by nearly 25,000 square miles," association attorneys said in the lawsuit.

The designation is unprecedented — the largest area set aside in the history of the Endangered Species Act — and was done for an animal that is abundant, with 20,000 to 25,000 animals in 19 subpopulations, according to the group, AP wrote.

AOGA represents 15 companies that account for most oil and gas exploration, production, refining, and marketing in Alaska. The group claims there is no evidence of an overall decline in the global polar bear population or its historical range.

That's disputed by the Center for Biological Diversity, which petitioned to list bears. "AOGA's suit is premised on

the fiction that polar bear populations are stable," attorney Brendan Cummings said in an e-mail, AP said.

A U.S. Geological Survey model suggests a better than 50% chance that polar bears will be extinct in Alaska's Beaufort and Chukchi seas under the minimum sea ice model run by 2030. The USGS later noted its projections of sea ice decline appeared to be underestimated. The Interior Department under former President George W. Bush declared polar bears a threatened species in 2008.

The department announced its critical habitat designation in November. It includes large areas of sea ice off the Alaska coast, including areas where petroleum companies hope to drill in the Chukchi and Beaufort Seas. Designation of critical habitat does not automatically block development, but requires federal officials to consider whether a proposed action would adversely affect the polar bear's habitat and interfere with its recovery.

The trade association said federal agencies underestimated economic effects of the designation and that it will cost tens of millions to billions of dollars. During testimony in June, director Marilyn Crockett said the designation would lead to project delays, additional consultations, and expensive litigation. The trade association said the designation was an abuse of discretion.

"The Service failed to balance the conservation benefits and the economic benefits to exclude areas where the benefits of exclusion outweigh the benefits of specifying such areas as part of the critical habitat," the lawsuit said. The association also said polar bear habitat already is adequately managed, and there's a long history showing interaction between bears and the oil and gas industry has had no more than a negligible effect.

Feds issue handful of deepwater drilling permits to resume work; industry wary

ExxonMobil Corp., ATP Oil & Gas Corp., BHP Billiton Petroleum, and Noble Energy became the first operators to receive federal permits to resume deepwater drilling in the Gulf of Mexico since last year's Deepwater Horizon rig explosion, which killed 11 workers and caused the largest oil spill in U.S. history. The permits are for Exxon's No.3 well in Keathley Canyon, ATP's Titan drilling and production platform in Mississippi Canyon, BHP's Shenzi field development in Green Canyon, and Noble Energy's Santiago prospect in Mississippi Canyon.

Exxon's approved permit is a revised permit to drill a well at the Hadrian prospect on Keathley Canyon Block 919 in 6,941 feet water depth, approximately 240 miles off the Louisiana coastline, south of Lafayette. The operator had a rig on location and an approved permit to drill a new well when activities were suspended due to the temporary drilling suspensions imposed following the Deepwater Horizon oil spill.

ATP's Titan permit, allowing the company to resume drilling the Mississippi Canyon Block 941 No. 4 well at ATP's 100%-owned Telemark Hub, is the first for a stationary deepwater facility since deepwater drilling was allowed to resume on Febuary 28. The BHP and Noble permits are for wells drilled by mobile drilling rigs. However, all three permits were for drilling projects suspended due to the moratorium. The Obama administration had yet to approve and permit a new deepwater exploration proposal submitted in the previous 11 months.

BHP Billiton's application for a revised new well permit to drill is for Well SB201 in Green Canyon Block 653, about 120 miles offshore Louisiana. BHP, a 44% equity stake holder in Shenzi, first began drilling the well in 4,234 feet of water in Febuary 2010 — two months before the blowout of the BP Macondo well that triggered the spill and spurred the administration's ban. Like all deepwater drilling, work has to comply with new safety and environmental mandates imposed since the spill. Companies also must prove they can swiftly contain a blowout in deep water, like the one at the Macondo well.

ATP Titan platform in U.S. Gulf

Santiago is a middle Miocene amplitude prospect on Mississippi Canyon Block 519. Noble Energy is the operator, with a 23.25% working interest. Located in 6,500 feet of water, the Santiago exploration well had previously drilled to a depth of 13,585 feet at the time of the moratorium. Drilling operations were anticipated to resume in late March 2011, targeting total drilling depth of about 19,000 feet. Results are expected by the end of May 2011, Noble Energy said, noting that the Ensco 8501 rig would perform the drilling.

However, given the federal government's overall slow pace in issuing drilling permits, industry's response after they were issued was less than enthusiastic. That could be because there were about 100 deepwater development plans that had yet to be cleared to even become eligible for a permit.

"As we said ... all new permits are welcome, but the administration has once again chosen to focus on baby steps, approving a permit for a project that was operational prior to the moratorium, instead of taking the steps necessary to produce the domestic resources this country needs," American Petroleum Institute Upstream director Erik Milito said in a statement.

Jack Gerard, chief executive officer of the American Petroleum Institute representing more than 450 oil and natural gas companies, said, "This slow moving process continues to stifle domestic production and puts thousands of jobs at risk in the Gulf and around the country."

Delineation well results point to 250 million barrel North Sea reserve

Statoil has drilled two delineation wells in the Dagny and Ermintrude discoveries in the North Sea to select a development concept. One exploration well on the Dougal prospect turned out to be dry with traces of hydrocarbons in the Hugin formation, and the other appraisal well on Dagny Central hit a 30m thick gas pay in the same formation.

The exploration well was drilled 4km southeast of the original Dagny discovery. The gas appraisal well lies 2km southeast. The wells were drilled to test the production properties of the Hugin reservoir rocks and to prove more reserves for the discoveries.

According to the firm's preliminary estimates, a Dagny-Ermintrude field development has a potential of up to 250 million barrels of oil equivalent. Statoil's head of the development Svein Olav Hoyland said that both wells provide important geological and technical reservoir data for the Dagny-Ermintrude project, which is in the conceptual development phase. "We'll now be taking a little time to evaluate this information in order to assess how it affects the choice of concept and timetable," he said.

Kosmos Energy encounters oil, gas on Tano block offshore Ghana

Kosmos Energy encountered oil and gas at its Enyenra-2A appraisal well in the deepwater Tano block, offshore Ghana. The Enyenra-2A well has oil and gas condensate in high quality stacked sandstone reservoirs. The hydrocarbon presence at the well confirms a downdip extension of the light oilfield discovered by the Owo-1 (renamed Enyenra) exploration well, which was drilled in 2010.

The well, located 7km south and downdip of the Owo-1, was drilled to intersect the upper channel where oil was discovered and the lower channel where gas condensate was found.

As per drilling data, the Enyenra-2A well intersected 69 feet of oil pay in the upper channel and 11m of oil pay in the lower channel. Kosmos used drillship Deepwater Millennium to drill the well to a total depth of 4,234m in a water depth of 1,674m.

Bahamas seismic data identifies potential offshore oil giants

Bahamas Petroleum claims to have identified numerous large oil prospects in its southern licenses offshore the Bahamas, according to the news publication Offshore.

The company commissioned two studies from Dr. Mark Rowan of Rowan Consulting and Lago Petroleum Consulting. They based their assessments on recently processed pre-stack time migration (PSTM) data, and preliminary mapping results of shipboard analysis of a 2-D seismic survey acquired over the licenses last month.

Both point to "giant" size structures that could contain several hundred million barrels of oil, Offshore said, noting that Bahamas Petroleum now has its first maps documenting the size and extent of closure of these features, based on 696 miles of seismic data.

Full PSTM processing of the 2011 2-D seismic was to be completed by end of April and will provide the basis for detailed structural interpretation and prospect evaluation. Bahamas Petroleum also has newly acquired gravity and magnetics data currently undergoing processing and a new Competent Persons Report to determine undrilled and unproven resource potential.

"Rowan (and Lago's) reports are significant because they provide the first modern interpretation of seismic data and exploration potential of (our) licenses from the Bahamian fold belt," Bahamas Petroleum chief executive Paul Crevello said. "These independent studies verify the extent and style of structural geometry of the large-scale folds, which was not possible from the historical seismic data."

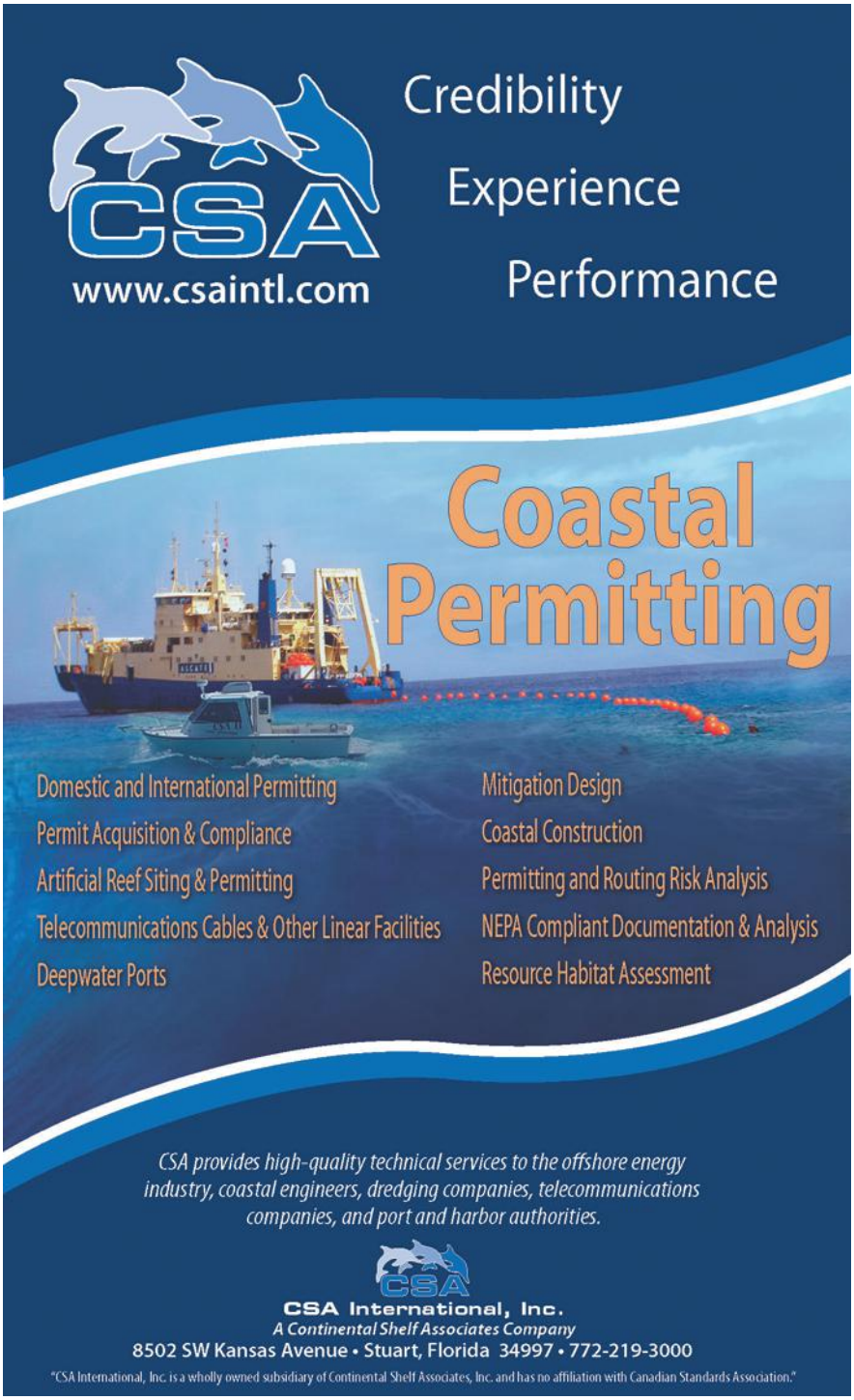
He said improved technology enabled exceptional resolution within the folds, allowing the company to see for the first time the lateral continuity of potential reservoir and sealing strata.

Rockhopper proves more oil close to Sea Lion discovery off Falklands

Rockhopper Exploration has proven further oil close to last year's Sea Lion discovery in the offshore North Falkland basin. The 14/10-3 well was drilled by the Ocean Guardian to a total depth of 9,285 feet in license PL032, 4.9 miles northwest of the discovery well. It was designed to explore the northern lobe of the Sea Lion fan feature, and is also the first well drilled in that area.

It encountered good quality reservoir from 7,956 to 8,317 feet within a sequence of four main sandstone intervals, including 210 feet of gross reservoir sand with net sand of 177 feet, a net to gross ratio of 84%. Rockhopper said wireline log interpretation was performed using resistivity of formation water (Rw) drawn from downhole modular formation dynamic tester (MDT) water samples from each sand.

The reservoir lies beneath a thick regional shale seal. Sands appear to be of good quality, with average porosity of 18% to 20% and peaks of up to 25%. Rockhopper believes that Sands 1-3 are likely related to part of the main Sea Lion feature, while Sand 4 could be related to the S2 feature. Oil and gas shows were detected throughout the reservoir intervals. Four conventional cores were cut through the reservoir totaling 331 feet, with bleeding of live oil and oil staining observed throughout. However, MDT samples on Sands 1, 2, and 4 returned water. The Ocean Guardian will next drill appraisal well 14/10-4, 1.4 miles northwest of the discovery well.



Study confirms Irish gas storage feasibility offshore eastern Ireland

AMEC has completed the first phase of a conceptual development study for a gas storage project offshore eastern Ireland. Providence Resources subsidiary EIRGAS commissioned the study for the Ulysses scheme in the Kish Bank basin, offshore Dublin.

AMEC started its program in 2008, the scope including planning, capacity modeling, infrastructural integration, and gas sourcing. The results confirm that construction of an offshore natural gas salt cavern storage facility at Ulysses is economically and technically feasible.

Various scenarios have been developed with a range of capacity, off-take export rates, and capital expenditure. Providence plans to acquire technical data relating to the subsurface geology, partly through the drilling of the nearby Dalkey Island exploration prospect.

"The initial results from the AMEC Ulysses study are very encouraging, as they provide a range of potential project sizes and development concepts which could be built to meet market requirements," said John O'Sullivan, Providence's technical director.

If developed, he added, Ulysses could deliver around 50% of Ireland's storage capacity as set out in European Union directives through one dedicated offshore facility while also providing security of supply through the cold winter months.

GeoGlobal, Exceed pact assures smooth Israeli drilling program

GeoGlobal Resources Inc., as operator of the Myra and Sara offshore licenses in Israel, entered into a drilling services agreement with Exceed Deep Water Drilling Specialists.

"Bringing Exceed onboard allows GeoGlobal and its partners to confidently move forward with the drilling program on our Myra and Sara licenses," said Paul Miller, president and chief executive officer of GeoGlobal.

"Israel is a great opportunity for GeoGlobal and a major focus," Miller said. "Executing on a preliminary drilling program in these licenses remains a near-term priority for the company."

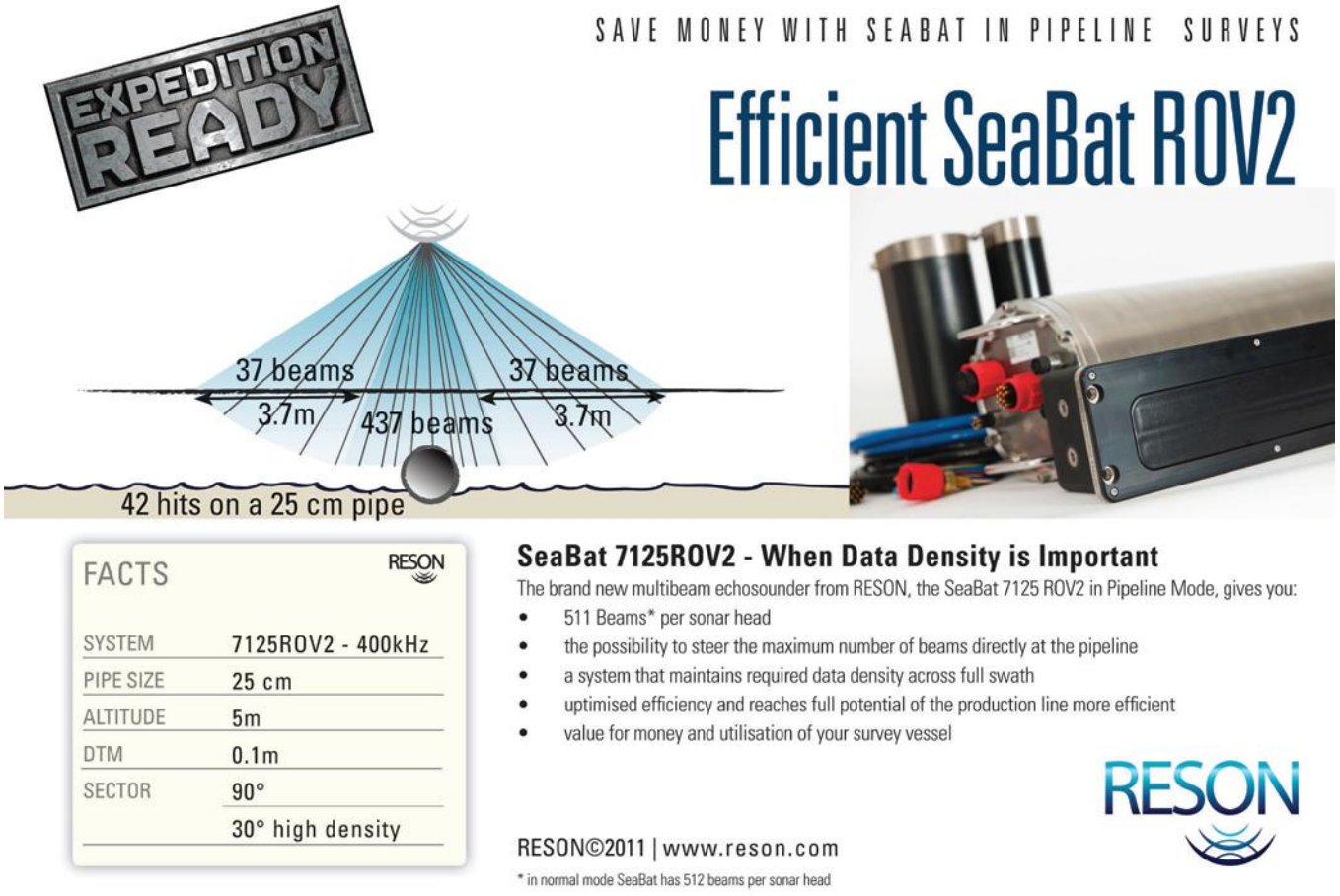
Exceed will proceed with the necessary engineering, commercial, and critical logistical arrangements and undertake any preparatory work involved with the drilling campaign on both the Myra and Sara licenses. To date, a 400 square kilometer 3-D seismic program has been acquired and processed on each license.

Cameron receives equipment order for two offshore platforms

Cameron received a contract valued at about $200 million from ConocoPhillips to provide equipment and services on two new platforms in the Greater Ekofisk Area Development offshore Norway.

The contract is subject to government approval of the Plan for Development and Operations (PDO) for Ekofisk South and Eldfisk II. The multi-year agreement calls for Cameron to furnish surface wellheads and Christmas trees for multiple wells during the contract term, with an additional provision for aftermarket support and services over the life of the field.

Meanwhile, Ithaca Energy started drilling the final production well for the development of the Athena field in Block 14 /18b, located in the Outer Moray Firth in the North Sea. The drilling operation using the Sedco 704 semi-submersible drilling unit was to last about 80 days. Ithaca plans to directionally drill the well.



Nexen boosts reserves at Buzzard, Scott-Telford complex in North Sea

Nexen proved 22 million barrels of oil equivalent of additional reserves last year in the Buzzard field in the UK central North Sea. The company said strong drilling and production performance led to increases in both reservoir size and the field's recovery factor.

Late last year, Nexen filed a field development plan for a proposed new hub for its discoveries in the Golden Eagle area as well as acquiring further acreage on trend to the north. The plan calls for standalone facilities handling 70,000 barrels of oil equivalent per day. Nexen anticipates sanction for the development later this year.

The Buzzard field

At the Scott-Telford complex, again in the central sector, Nexen spent $150 million on further development last year, adding 6 million barrels of oil equivalent of proved reserves from development drilling. The company sees further upside in the area with opportunities for speedy tiebacks. Rochelle is one of the candidates for a tieback to the Scott platform.

In the UK's recent 26th offshore licensing round, Nexen applied successfully for 10 licenses covering 18 blocks in the North Sea. Most are close to the company's existing acreage and infrastructure.

CDA report highlights value of subsurface knowledge for E&P

Effective management and understanding of subsurface data brings tangible benefits to exploration and production, according to a report by Common Data Access (CDA). The report, based on research by oilfield service company Schlumberger, suggests that a quarter to a third of the total value generated each year from E&P activities can be attributed to improved analysis of subsurface geology.

Over 20 senior executives from oil and gas companies in the UK and Norway were canvassed for the report, which focuses on how companies value and apply their subsurface data to E&P. This information typically includes exploration data (including seismic surveys), production data (such as hourly flow readings), and interpreted data in the form of information that includes processed seismic and dynamic reservoir models.

The report examines the total value delivered each year by projects; the company's balance between exploration, production, and development; the contribution of subsurface knowledge to these activities; and to what extent subsurface interpretation depends on the data.

The authors found that 70% of value in E&P is generated by subsurface understanding, which is derived in turn from the people, tools, data, and the processes applied to manage the data. The majority (38%) of subsurface understanding surface relies on data.

"Enhanced understanding of data enables companies to increase the value of their assets by helping them increase production or reserve estimates or identify ways to more effectively develop an asset," Malcolm Fleming, CDA's chief executive officer, said, emphasizing that companies can, therefore, heighten overall performance by investing in data quality and properly managed data.

Muscular 10 pack powers new ROV

Packed with 10 powerful thrusters and the capacity to carry a seven-function position feedback manipulator and five-function rate manipulator, the new Saab Seaeye Panther XT Plus has quickly become a top seller with four systems sold for delivery this year.

With 50% more power and swimming 30% faster, operators value the ability of the new Panther to hold steady in strong shallow-water currents, making it ideal for a range of work and survey tasks. Although rated to 1500m water depth, the application of the Panther XT Plus in high current shallow water locations is creating the main interest from customers who wish to have more capability in these more difficult areas of operation.

To speed the completion of complex tasks, operators also value the heavy-duty power and precise control coming from the introduction of industry standard seven-function position feedback manipulators, which was not possible on other versions of Panther.

To accommodate these larger and heavier manipulator arms and provide additional capability for a greater range of tools and sensors, the vehicle payload has been significantly increased by re-designing the frame and buoyancy of the widely proven Panther concept.

For operators working to a tight deadline or in difficult conditions, having 10 thrusters in hand brings peace of mind by offering a reassuringly high degree of redundancy.

Cost savings are a particular attraction to operators, with the Panther XT Plus having the work class capability of a small hydraulic work ROV.

For more information, visit www.seaeye.com.

Schilling's HD™ ROV earns OTC award

Schilling Robotics, LLC, experts in subsea systems, announced that it has received a 2011 Spotlight on New Technology Award from the Offshore Technology Conference (OTC) for its new Heady-Duty (HD™) ROV. The honor, which recognizes innovative technologies that significantly impact offshore exploration and production, was awarded to Schilling for the HD's technological advancements.

Schilling's HD™ is a 150hp, 4,000m rated, work class ROV designed to elevate the performance and effectiveness of deepwater remote intervention. The HD™ simplifies ROV operation and maintenance through the application of an enhanced, integrated system design. This allows operating personnel to focus on the requirements of their customer instead of primarily focusing on piloting or maintenance skills. One of the most significant advancements with the HD™ is the adoption of modular mechanical, electrical, and control subsystems, which reduce the time requirements for all maintenance tasks to one hour or less. This step-change improvement will enable ROV operators to increase operational efficiency, which is particularly critical on projects where vessel day-rates can be as high as $500,000 per day.

"This award recognizes the commitment and dedication that our employees have made to elevate the performance and reliability of ROV systems," said Tyler Schilling, CEO of Schilling Robotics. "The subsea industry is maturing at a rapid pace, and ROVs have an ever-increasing role in both the technical and commercial success of every deepwater project."

The HD™ not only reflects Schilling's 25 years of experience in advancing industry expectations of remotely operated systems, but also the long-term collaboration with FMC Technologies in the development of technologies to improve remote intervention of subsea equipment. Deepwater operations present a unique set of challenges that require innovative solutions, and the HD™ addresses these challenges by significantly simplifying system design while achieving superior performance.

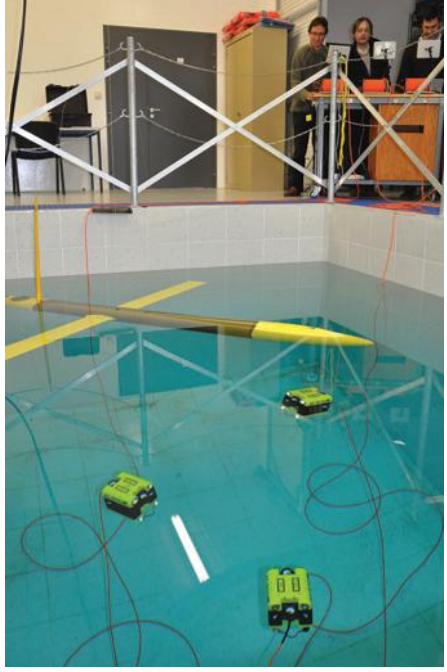
Schilling (www.schilling.com) will receive the OTC Spotlight on New Technology award during a ceremony and press conference at 4:00 p.m. CDT on Monday, May 2, in the Rotunda area of Reliant Center. The HD™ will be on display in the FMC Technologies booth (#1941) during the conference, which runs May 2 through May 5 at Reliant Park in Houston, Texas.

Smart AC-ROVs go their own way - together!

Longtime AC-ROV distributor ITER has delivered a block order of three systems to the Ocean Sensing and Mapping Laboratory (OSM) of the world renowned research institute ENSTA-BRETAGNE (Brest, France). OSM focuses on extracting and using data in uncertain environments through the operation of smart self-controlled systems.

Deployed in a research and training role, the AC-ROVs have been modified to enable target inspection as a PC-controlled coordinated group, rather than separate pilot controlled individuals. The systems employ Optical Character Recognition (OCR) to enable auto depth, reflected light-activated object avoidance and other vehicle and tether recognition.

The project has so far achieved autonomous behavior for a single AC-ROV. The vehicle has successfully inspected the inside of a 2m-long, 300mm diameter pipe. The use of "smart vehicle swarms" has potential applications in various industries, including subsea inspection, environmental monitoring, and military and security operations.



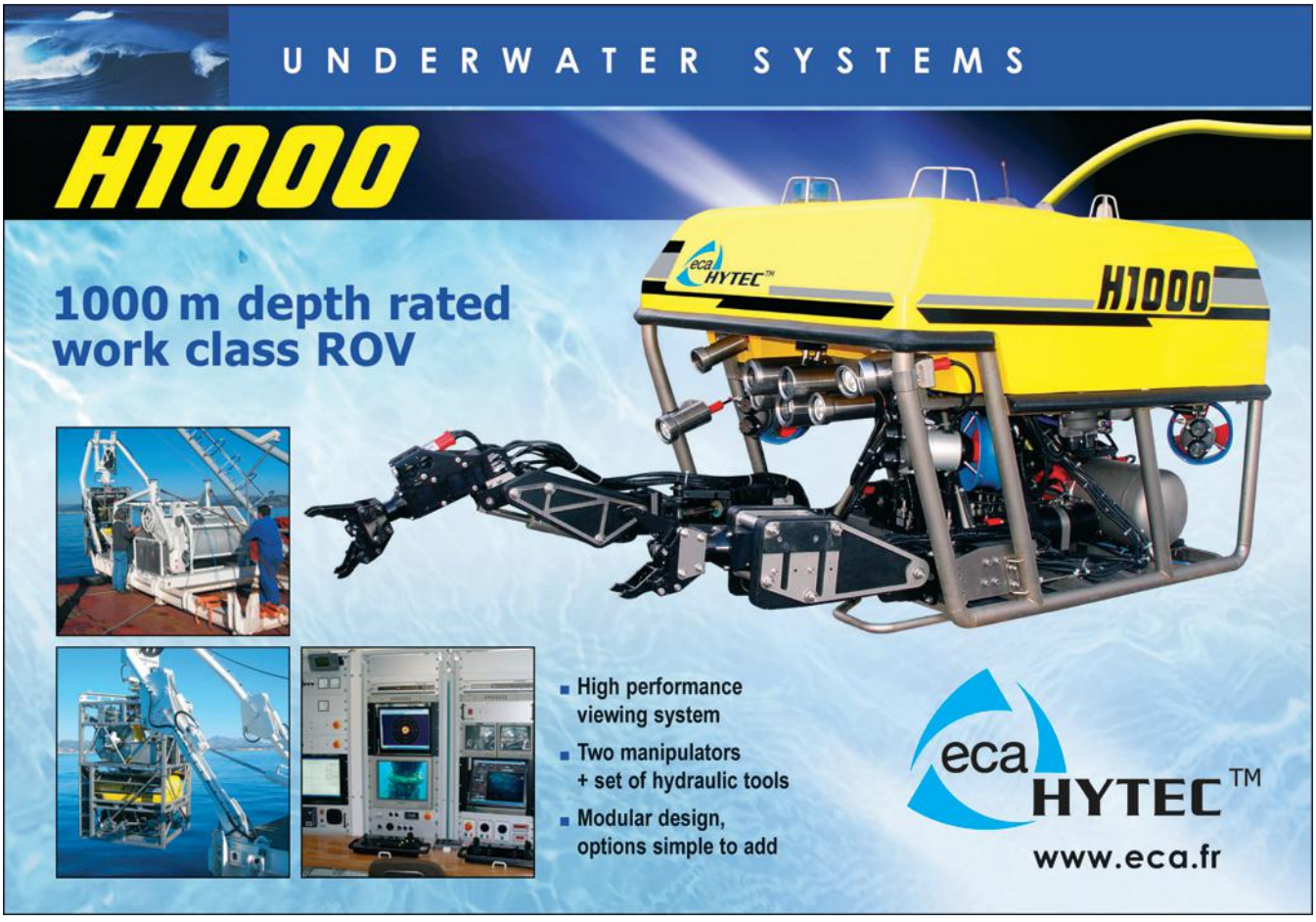
For more information, visit www.access.com.

AMPOL awarded USCG contract

The Oil Stop Division of the American Pollution Control Corp. (AMPOL), the industry leader in oil spill response and total environmental solutions, has been granted a Phase 2 contract for development and testing of its OSBORS (Oil Stop Bottom Oil Recovery System) submerged oil recovery system by the United States Coast Guard Research and Development Branch.

"Working with the United States Coast Guard Research and Development Branch is a great honor," said CEO Kirk Headley. "This partnership validates our status as world leaders positioned on the cutting edge of oil spill recovery technology."

The OSBORS is a specialized package of equipment designed to remove oil that has settled on the seafloor. The heart of the system is the Tornado Motion Technologies (TMT) SUBDREDGE. The SUBDREDGE is a remote-controlled, track driven vehicle equipped with TMT's EDDY Pump. Additional top-side support equipment is included for separating recovered oil and *in situ* treating of water and solids.



Phase 2 of the contract involves final design and planning for live testing at the BOEMRE OHMSETT facility in Leonardo, New Jersey in late 2011.

For more information, visit www.ampol.net.

Gorski joins Aqua Lung

Aqua Lung has announced the acquisition of G2000SS Inc., manufacturer of the Gorski diving helmet.

The Gorski helmet is an innovative design pioneered by Mr. Les Gorski. When the current version was introduced to the commercial diving market in 2003, it was heralded as a game changer in terms of materials, build quality, robustness, and maintainability.

The acquisition of Gorski adds the Gorski helmet as a key product to the Aqua Lung product range. The Aqua Lung group of companies has an objective of providing equipment for the global commercial diving industry —the Gorski helmet is a strong and complementary fit with this professional diving business.

As a member of the Aqua Lung group, the Gorski product will benefit from additional resources and the combined expertise of world-class sales, engineering, and design teams. This synergy will provide a solid foundation for existing product sales and enable further development of the Gorski helmet in order to keep pace with diving industry requirements.

The owner of G2000SS, Mr. Les Gorski, has joined the Aqua Lung team on a full-time basis to coordinate the manufacturing and sales of his helmet and to assist with development of new products for the commercial diving industry. More information is set to follow later this year.

To learn more about Les Gorski, visit www.gorskihat.com. To learn more about Aqua Lung, visit www.aqualung.com.

New BlueView 2-D imaging sonar for deepwater ROV applications

BlueView re-engineered its popular P Series Imaging Sonar platform to create the smallest deepwater solutions that meet the stringent requirements for ROV operations. The new P Series Deepwater Systems deliver incredible detailed imagery and accurate point-to-point measurement in a compact, economically priced 2-D imaging sonar. Able to operate at depths of 3,000m the new deepwater systems enhance real-time ROV navigation, obstacle avoidance, operations monitoring, inspections, and object detection even in low and zero visibility conditions. The compact size, light weight, and low power consumption make ROV integration easy.

BlueView is the leader in 3-D mechanical scanning sonar and 2-D imaging sonar technology with more than 450 installed systems worldwide. BlueView Technologies' advanced sonar systems are currently deployed on AUVs, ROVs, surface vessels, fixed positions, and portable platforms and have been adopted by leading manufacturers and service providers to support mission critical operations. BlueView customers enjoy a low cost of ownership with reliable operation, exceptional service, in-person training, extensive online information, and worldwide after-sale support.

For more information, visit www.blueview.com.

Divex provides assistance to the Discovery Channel for a Mighty Ships episode

Divex, headquartered in Westhill, Aberdeen, Scotland — recognized as a global centre of excellence for subsea technology — has used its HeliCom™ Helium Unscrambler technology to unscramble raw helium audio for an episode of Mighty Ships for the Discovery Channel.

The Mighty Ships series follows various types of vessels on a journey, depicting how the ship and its crew operate.

While filming onboard the Skandi Arctic the upcoming episode, the Discovery Channel made a number of raw helium audio recordings of diver speech, including those of divers in Saturation Chambers and while diving at depth.

With their breakthrough Helium Unscrambler technology, Divex unscrambled the raw helium audio files at their Westhill facility, using the HeliComTM Unscramblers. This meant they were able to provide the Discovery Channel with clear audio files that can be used within the documentary.

Unique Maritime Group completes saturation diving system for McDermott International

Unique Maritime Group, a leading global provider of integrated support services for the offshore industries, is pleased to announce the successful completion of the first of two portable saturation diving systems for McDermott International, Inc.

The turnkey design and build of the system was carried out by Unique Hydra (Pty) Ltd, a division of Unique Maritime Group, based in Cape Town, South Africa.

The 12-man, 300m, saturation diving system was designed to be functional, yet comfortable, and consists of five locks in two chambers, complete with LCD displays and internet access points. The system also includes a Self Propelled Hyperbaric Lifeboat (SPHL) on a mobile davit that is the first of its kind to successfully manage the evacuation of 12 divers in saturation mode.

The completed saturation diving system complies with the latest DNV regulations, including active load monitoring and green sea loadings for all manned spaces.

For more information, visit www.uniquegroup.com.

S³ acquires new ROV technology

Specialist Subsea Services Ltd (S^3), a provider of Remotely Operated Vehicle (ROV) and survey services to the international energy industry, has announced a seven figure acquisition of two new ROV systems to expand its work class fleet.

The acquisition adds to the capacity of S^3 to undertake the widest range of ROV tasks, including drill support, high-quality survey works, and heavy intervention tooling down to 3,000 meters.

The two Triton XLX 150hp ROV systems are advanced work class units manufactured by Perry Slingsby Systems Ltd, one of the world's largest makers of ROV systems.

The new XLX units feature "auto-station-keeping", high bandwidth survey multiplex and power circuit facilities, with a new "video wall" Human-Machine Interface (HMI) combined with intuitive touch-screen operator display and integrated diagnostics system, which reduces operator fatigue and improves overall services delivery efficiency.

For more information, visit www.specialistsubsea.net.

KT partners with SpeedCast
KT has signed an alliance agreement with SpeedCast Limited, a leading satellite telecommunications service provider, to deliver global maritime network services for its international maritime customers via SpeedCast's global Ku-band network. As part of the alliance agreement, SpeedCast will provide access to its global Ku-band maritime network for KT's international maritime customers. In return, KT will provide SpeedCast with access to its own Ku-band coverage along the Korean coast line and beyond, using its Koreasat 5 satellite. Furthermore, the two companies will link their teleports and satellite hubs to offer their customers a more resilient and robust service. By coordinating technically, KT and SpeedCast can achieve operational efficiencies while delivering expanded coverage and reach for their customers.

Cobham partner for new Global Xpress service
Inmarsat has announced the selection of Cobham plc as the initial launch partner for maritime satellite terminals for its forthcoming Global Xpress service. Sea Tel, a subsidiary of Cobham, has been awarded contracts to develop, manufacture, test, and distribute Global Xpress maritime satellite terminals. As initial launch partner, Sea Tel will ensure availability of Global Xpress maritime satellite terminals at service introduction planned for 2013. Sea Tel will develop a new terminal specifically designed for operation in the Ka-band and utilize a new Core Module developed by VT iDirect (iDirect). Working together, iDirect's Core Module and Sea Tel's Marine Terminal will provide state-of-the-art capabilities fully consistent with the Global Xpress objective of delivering up to 50Mbps downlink speeds to 60cm aperture terminals.

Globecomm launches Globecomm Maritime
Globecomm Systems Inc. has launched Globecomm Maritime to provide a comprehensive suite of maritime communication solutions for the maritime market sectors: commercial, fishing, leisure, and government. Globecomm Maritime is the result of the integration of the company's well-known maritime business units with Globecomm's global managed communications platform and engineering capabilities. Four well-established Globecomm companies, Telaurus, Mach6, Evosat, and Carrier2Carrier, each adds a vital piece to the communication jigsaw whether they be Inmarsat, Iridium, or VSAT based, Globecomm Maritime has the solution in its portfolio, all under-pinned by the unrivalled experience and resources of the Globecomm group.

TransIT Solutions partners with Boatracs
TransIT Solutions has partnered with Boatracs, a maritime communications solutions provider, to develop a web-based solution for the commercial maritime industry. The partnership will combine TransIT Solutions' strength in developing Internet-based GPS applications with Boatracs' unparalleled experience in providing service to the wireless maritime market. The new software will incorporate TransIT Solutions' TransFUSION Network™ product, a cutting edge web application for the shipping and logistics industry. Providing the core architecture, TransFUSION Network will greatly improve Boatracs' speed to market.

Marlink secures contract with Fugro-Geoteam

Marlink, the global provider of maritime satellite communications, has recently extended its contract with seismic vessel operator Fugro-Geoteam for another five years. As part of the latest agreement, Marlink will supply its innovative Sealink(TM) VSAT service to the seismic vessels via Marlink's Eik teleport in Norway, providing 512Kbps of bandwidth and 10 to 15 telephone lines for each vessel.

"For safe, efficient, and reliable operation of our vessels worldwide, it's important to have satellite communications solutions that we can trust. Marlink has proven to supply us with high-quality services and bandwidth, reliable connectivity and great flexibility to tailor solutions to our specific needs," comments Øyvind Haddal, ICT-Manager, Fugro-Geoteam AS. "We are very satisfied with the level of service provided by Marlink and are glad to be extending our agreement with the company further."

Marlink's latest contract with Fugro-Geoteam follows a new global agreement with Fugro Marine Services BV, which has established Marlink as a preferred supplier of VSAT communications to Fugro vessels worldwide. The new agreement offers a special benefit to both companies, enabling Fugro to take advantage of increased cost efficiency and flexibility of service, while Marlink further strengthens its relationship with one of the world's leading data collection service providers.

Owning several teleports worldwide, including Eik in Norway, Marlink is able to provide high quality, reliable connectivity as well as exceptional flexibility of service. The company has also established customer service centers operating in major regions throughout the world. This level of regional presence means that Marlink is able to offer faster, more effective, and locally focused service intervention and customer support when required.

Marlink's comprehensive portfolio ranges from its own VSAT solutions Sealink™, WaveCall™ and @SEAdirect™, to MSS on-demand services, including Inmarsat FleetBroadband and Iridium OpenPort.

For more information, visit www.marlink.com.

Stratos launches FBBPlus service

Stratos Global announced the commercial availability of FBBPlus, its managed global broadband service for the maritime industry. Stratos' innovative FBBPlus solution offers shipping companies a highly flexible migration path toward Inmarsat's Global Xpress 50Mbps services, which is expected to be commercially available in 2014.

FBBPlus combines Inmarsat's popular FleetBroadband satellite communications service with Ku-band VSAT service. For a flat monthly fee, FBBPlus offers a managed data communications capability of up to 25GB per month.

The turnkey service offering, predictable cost, and high data allowance make FBBPlus ideally suited for global shipping companies that are customizing their own network environment and require greater throughputs and bandwidth.

Stratos recently began deploying FBBPlus on approximately 40 vessels for Hapag-Lloyd, under a five-year contract. Hapag-Lloyd, based in Hamburg, is one of the world's largest shipping companies and is recognized as having developed one of the shipping industry's most advanced IT systems.

FBBPlus is the only service that delivers a managed MPLS extension network over separate L-band and Ku-band networks, delivering resilient and redundant paths. The MPLS network separates and logically manages business, crew, and non-essential traffic — while delivering high-quality voice communications via the highly efficient Inmarsat circuit-switched network.

For more information, visit www.stratosglobal.com.

Buss Data to receive broadband solution

Vizada and Telemar have signed a three-party deal with the German IT company Buss Data GmbH, a part of Hermann Buss Group, to provide a high-performance broadband communications solution for the company's fleet of vessels.

The Hermann Buss Group shipping company based in Leer, Germany specializes in commercial shipping and runs a fleet of over 85 vessels. Its Buss Data business unit develops customizable software systems that cover all aspects of ship management such as purchasing/ordering, maintenance, crew welfare, and insurance as well as a complete system for document filing. Telemar and Vizada were awarded this contract to provide communications systems onboard Buss vessels. Over the course of the 2-year deal, Buss Data will equip the whole Buss Shipping Company fleet with the newest generation of Inmarsat FleetBroadband terminals. Telemar will take care of the hardware and technical maintenance of the terminals. as well as of the airtime management and billing, while Vizada will provide reliable satellite communications and customer care.

The value-added Vizada Solutions™ help customize this communications package by offering more flexibility to administrators and crew. Vizada's Terralink® Data Manager and The Source® will be deployed with the new FleetBroadband terminals in order to provide further control and money-saving solutions to the company while SkyFile® Antivirus ensures secure IT systems.

For more information, visit www.vizada.com.

Subsea Cables

Japan earthquake damages cables, factory

The magnitude 8.9 earthquake and subsequent tsunami that hit northeastern Japan on March 11 caused heavy damage to Japan's submarine fiber optic cable network, but failed to knock out the country's access to the global Internet. According to reports, four major submarine cable systems were damaged by the quake: the transpacific Pacific Crossing and Japan-US cables, as well as the regional EAC and APCN-2 systems. The outages disrupted communications not only in Japan, but elsewhere in the region such as the Philippines, Hong Kong and Malaysia. The disruptions, however, mostly took the form of slow Internet access rather than complete outages, as traffic was quickly transferred to other cable systems. Despite the damage to four major cables, the Internet held up extremely well under the circumstances and essential international communications remained available in Japan throughout the crisis. By March 22, NTT Communications reported that efforts to repair the damaged submarine cable systems were underway and that the cables would be fully restored in April or May. The earthquake also damaged Hitachi Cable's submarine fiber optic cable manufacturing plant at Minato, which was hit by a 1.5m tsunami. No Hitachi personnel were injured, but the plant was inaccessible until March 23, when the company began evaluating the condition of the building and equipment. There is no word yet as to when the restart of production will be possible.

Dhiraagu to lay Maldives cable network

Dhiraagu has signed a $21.7 million contract with NEC Corporation to lay a submarine fiber optic cable network across the entire Maldives. This is a major milestone in the history of Maldives that would revolutionize the landscape of telecommunication in the country.

Lancer announces test report

Lancer Systems of Allentown, Pa. announced the publication of a comprehensive test report that details the Environmental & Mechanical Testing of Lancer's High Pressure, High Temperature Optical Penetrator Assembly. Lancer is pleased to share this report with those involved with fiber optic products utilized in the subsea, offshore, and well drilling industry. This penetrator assembly utilizes Lancer's patented metal-to-metal sealing process that enables a high-strength hermetic seal between glass fibers and the surrounding metal body. It is capable of withstanding up to 25,000 psi of pressure and temperature from -40 to 175 degrees Fahrenheit. A six-channel version of this product is scheduled to be installed next month in a sensor system that will monitor the deformation of casing and sand screens in the well of a major oil producer in the Gulf of Mexico. 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. These products are currently employed in downhole well logging, aerospace, communications, unmanned underwater vehicles, and other applications. A copy of this report can be obtained by contacting Jim Braddock at jbraddock@Lancer-Systems.com.

CeltixConnect awarded consent for submarine cable

CeltixConnect has been awarded subsea consent, in the United Kingdom for the deployment of Europe's most modern submarine telecoms cable linking Ireland and the UK. The consent was awarded by DEFRA (Department of Environment, Food and Rural Affairs) following detailed consultation with vested interests in the UK and marks a significant milestone in the deployment of the first European telecoms cable in over a decade.

The CeltixConnect cable lands in the heart of Dublin's business district at East Point Business Park and the Irish Financial Services Centre (IFSC), connecting from there to the T50, Dublin's major metropolitan network that links all key business districts, data centers, and business parks. Ireland's continued success in attracting digital services foreign direct investment is dependent on its ability to deliver on the fundamentals of high-capacity communications infrastructure - the most critical of which is a modern sub-sea cable capable of transporting content and data in and out of the country securely and at the highest speeds.

In the UK, the privately-owned carrier neutral submarine cable lands at Porth Dafarch, North Wales and will have the ability to connect to the Welsh Assembly Government-funded "FibreSpeed," an open-access fiber optic network that connects Holyhead to Manchester, and with a number of other major fiber optic networks that connect into London and onto mainland Europe and Asia-Pacific.

For more information, visit www.celtixconnect.com.

GBI completes Vodafone landing in Qatar

Gulf Bridge International (GBI), the Middle East's first privately-owned submarine cable operator, along with its partner, Vodafone Qatar, has announced the landing of its new cable at Vodafone's international cable landing station just north of Doha.

Launching later this year, the GBI cable system is a high-capacity, fiber optic cable that will connect all the countries of the Gulf region to each other and provide onward connectivity to Europe, Africa, and Asia. The system will provide an alternative connection from Qatar to the outside world and significantly increase Qatar's international call and data capacity. The cable landing near Doha is one of 10 planned cable landings around the Gulf region, through which GBI will offer the most comprehensive geographic reach of any subsea network in the region.

Over the coming months, the cable ship, Responder, will continue to install the GBI cable system, which is configured as a self-healing ring within the Gulf. The GBI cable system deploys several state-of-the-art technologies, such as new dual-stage repeaters and wavelength monitoring units.

For more information, visit www.gulfbridgeinternational.com.

Huawei Marine wins BDM contract

Huawei Marine Networks Co. Ltd. has won the bidding for the BDM (Batam-Dumai-Melaka) submarine fiber optic cable project and will provide the end-to-end turnkey submarine system solution.

The BDM project will complete a cable system between Melaka, Malaysia and Dumai and Batam, Indonesia by the fourth quarter of 2011. The completion of this new system will bring the leading submarine telecommunication technologies to Malaysia and Indonesia, providing exceptional bandwidth improvement for these two countries and satisfying their soaring demand for international communications.

The BDM system will cross the Straits of Malacca, an area of extraordinarily busy shipping lanes and strong tidal currents. This area is predominantly shallow water with a maximum depth of only 60m. The cable route will have eight pipeline and sea-cable crossings in a relatively short distance. Huawei Marine will carry out the installation in this busy and complex environment, showcasing its delivery and installation capabilities.

For more information, visit www.huaweimarine.com.

Infinera selected for MedNautilus

Infinera has been selected by MedNautilus to upgrade its subsea network for the speed of deployment and scalability of the Infinera submarine solution.

MedNautilus, the Mediterranean operations of the Telecom Italia Sparkle Group, operates a subsea link between Israel and Cyprus as part of a larger submarine cable network connecting the eastern Mediterranean to Greece, Turkey, Italy, and France that serves the growing capacity needs of the region.

The Infinera network has enabled MedNautilus to quadruple capacity on its network. It has also delivered benefits in terms of simple operation and speed of deployment, with the network upgrade completed in less than half the time a traditional subsea network would have required. T h e Infinera DTN as SLTE (submarine line terminating equipment) provides a set of application-optimized features for upgrading submarine cable networks, including support for high-reliability trans-oceanic optical transmission, low-cost and low-latency full-band dispersion compensation optimized for greatly reduced size, integrated low-cost terrestrial backhaul and submarine network inter-connection, and undersea cable connectivity solutions optimized for operating over existing cable systems.

For more information, visit www.infinera.com.

Pacific City cable station acquired

The submarine cable landing station in Pacific City, Oregon has been purchased and a portion of it leased for a scientific research project.

The Pacific City cable station was built by Pacific Telecom Cable for the North Pacific Cable (NPC). Completed in 1991, NPC connected Pacific City to Miura, Japan, with a branch to Seward, Alaska. The cable was retired in 2005.

Last year, the cable station was acquired by Tillamook Lightwave (TLW), an Oregon ORS Chapter 190 Inter-governmental Agency. The mission of TLW is to develop a fiber network within the County to support high-speed telecommunications which will promote economic development.

DTS
Data Technology Solutions

F/O Technology

Interoute trials 100G transmission on subsea network

Interoute and Infinera have completed a demonstration of Infinera's new 500Gbps photonic integrated circuits (PICs), successfully delivering 100Gbps channels on the Interoute pan-European network. Interoute, whose pan-European network was the first in Europe to deploy Infinera's 100Gbps photonic integrated circuits more than three years ago, is planning to use Infinera's next generation systems based on 100Gbps channels enabled by 500Gbps PICs to ensure it continues to lead the way in supporting Europe's insatiable demand for high capacity bandwidth. Interoute's Next Generation Network is the most advanced in Europe and Interoute is working closely with Infinera as Infinera brings to market a high-capacity solution based on coherent transmission of 100Gbps channels.

The demonstration took place between Amsterdam and London. The 100Gbps channels originated in Amsterdam and traveled under the North Sea to London, where they were looped back and returned to Amsterdam, for a total distance of 940 km. The signals were received error-free despite a lengthy unrepeatered subsea link of 210km between the Dutch and English coasts. Each 100Gbps channel is capable of carrying over 200,000 simultaneous video conferences between London and Amsterdam, or over 1.5 million telephone conversations. This is the first demonstration of Infinera's PIC-based 100Gbps channels transmitted on a European network.

The coherent 100Gbps channels were transmitted on fiber simultaneously carrying 200Gbps of live traffic over 10Gbps channels, demonstrating that the Infinera Line System (ILS) can carry both types of optical signals without interference. Interoute is planning to introduce PIC-based 100Gbps channels next year, to enable customers to enjoy a seamless transition to the new era of high-capacity bandwidth.

For more information, visit www.interoute.com or www.infinera.com.

100G technology tested on existing cable

Nokia Siemens Networks has achieved a record 100 Gbps speed in DWDM transmission over 4,000km.

Global operators, including privately-owned submarine cable network players, can now achieve a cost-efficient, 10-fold increase over the original design capacity of their cables. Nokia Siemens Networks has successfully tested its Submarine Line Terminal Equipment (SLTE) solution, demonstrating the longest 100G DWDM transmission result yet achieved over installed undersea cable.

The trial was performed over a submarine segment between Florida and Puerto Rico for a major submarine cable network. As part of the demonstration, Nokia Siemens Networks also achieved 40G DWDM transmission over a distance of 9,000km.

Nokia Siemens Networks' SLTE solution based on its hiT 7300 platform increases the capacity of the already deployed undersea cable links by adding 40G and 100G DWDM channel and bandwidth management capabilities to support current and future network requirements. The upgrade can reduce the bottleneck in the submarine part of the network as well as integrate it smoothly into the terrestrial network through the use of new technology at a network management and operations level.

Nokia Siemens Networks' SLTE solution with new transmission capacities of 40G and 100G will be commercially available this year.

For more information, visit www.nokiasiemensnetworks.com.

Scotland-England Power Cable Planned

National Grid and ScottishPower Transmission (SP Transmission) have announced plans for a new 2,000MW subsea power cable that will bring renewable energy from Scotland to England. The companies are working together to deliver a major project to build a 400km high-voltage circuit that will run predominantly under the sea from Scotland to England and Wales.

The new circuit will enable the transfer of large volumes of energy from Scotland directly to England and Wales through subsea cables, bypassing the constraints on the existing transmission system. Scotland traditionally generates more electricity than it consumes and, as new renewable energy projects continue to come online, it is anticipated that exports will increase.

It is proposed that the new circuit will begin at Hunterston, in Ayrshire on the west coast of Scotland, and will run through the Irish Sea to the tip of the Wirral peninsula on Merseyside. Here, it will travel across the Wirral to Connah's Quay in North Wales.

For more information, visit www.nationalgrid.com or www.scottishpower.com.

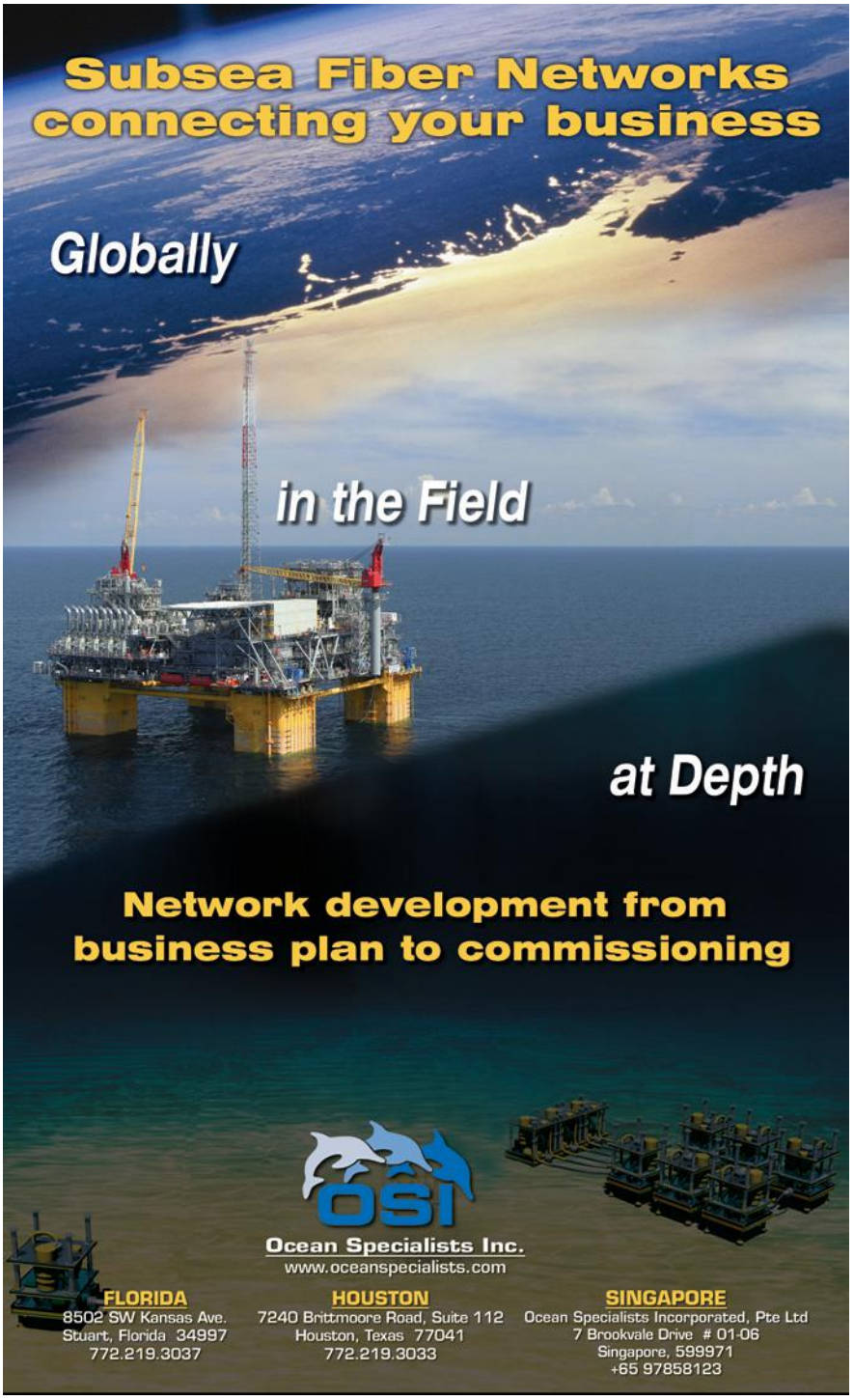
Nexans awarded contract to supply Anholt Wind Farm

Nexans has been awarded a contract by DONG Energy, based in Fredericia, Denmark, to supply the submarine cables and related accessories for the Anholt Offshore Wind Farm.

The order, worth around 30 million Euros, also includes the installation and commissioning of the cables. Roughly 160km of medium-voltage 34kV cables are required to connect the 111 wind turbines with each other and to link them to the offshore transformer station. The cables are manufactured in three different cross sections to meet the different transmission requirements. The cables will be produced at the Nexans plant based in Hanover in Germany and delivery is scheduled for the second quarter of 2012.

The Anholt Offshore Wind Farm is located in the Kattegatt, sea area between Denmark and Sweden, approximately 20 km off the Danish coast between Djursland and Anholt Island. A total of 111 wind turbines, each generating 3.6MW (in total 400MW) of electrical power, are to be placed over an area of 88 square km.

The operator, DONG Energy, would like to start generating electricity at the



Anholt Offshore Wind Farm as early as the end of next year. The generated electrical power will cover the electricity needs of around 400,000 households. In the future, the wind farm will be able to cover around 4% of total Danish electricity consumption and make a significant contribution to meeting the country's climate protection goals. Denmark wants to increase the share of renewable energy in its energy mix to 30% by 2020.

For more information, visit www.nexans.com.

Global Marine Energy opens for business in Boston

Global Marine Energy, Inc. has announced the opening of its office in Boston, Massachusetts. Global Marine Energy is an American-owned licensee of Global Marine Systems Ltd, the market leading offshore cable installation and marine engineering company.

For over 160 years, Global Marine has been successfully installing cable throughout the world's oceans and for the past decade has been involved in many of the offshore wind projects that have been completed in the North Sea.

Global Marine Systems Ltd, and now Global Marine Energy, Inc., believes that many of the issues that have plagued the industry in Europe can be avoided in North America through proper planning and demonstrated experience.

Offshore power cable installation has been particularly troublesome in the North Sea, resulting in cost overruns, insurance losses and the failure of a number of companies who had made the decision to enter the market.

The types of problems that have regularly occurred are often in the areas of installation procedure, resulting in cable damage, and installation delay due to lack of installer experience and the use of improper equipment.

Over the past decade approximately 4GW (4,000MW) of offshore wind power have been installed in European waters. With an additional 15GW already consented and an estimated 25 to 50GW in the planning stages, the European market is well underway.

With both offshore wind and interconnect projects in the planning stages up and down the East Coast and in the Great Lakes, the North American market is beginning to move forward.

For more information, visit www.globalmarinesystems.com.

SBSS completes post-lay inspection for China Southern power grid

In January 2011, S. B. Submarine Systems (SBSS) Co. Ltd.'s cable ship Fu Hai and ROV Sea Lion successfully executed post-lay inspection for 500kV submarine power cable in Qiongzhou Strait in South China for the China Southern Power Grid.

The SBSS ROV Sea Lion uses the TSS350 subsea cable detecting system, which SBSS says is the most advanced in global submarine cable industry. TSS350 is able to detect cables buried

10m under the seabed. The system played a key role in the cable inspection project.

The Fu Hai and Sea Lion met strong currents of over 3.6kts during the work, but overcame them thanks to the experience of SBSS crew, the company said. SBSS carried out different inspections, including burial depth inspection, cable exposure, suspension and corrosion inspection, and route obstacle inspection. The inspection provides reliable data for customer's long-term system maintenance.

China Southern Power Grid is a Chinese state-owned power company. and its business covers five provinces in South China including Guangdong, Guangxin, Yunnan, Guizhou and Hainan.

For more information, visit www.sbsubmarinesystems.com.

Draka awarded wave and tidal Renewable Energy Centre order

The European Marine Energy Centre (EMEC) has once again selected Draka as their submarine power cable provider with a further purchase of cables and logistical solutions.

The new contract requires Draka to deliver 5,000m of 20kV subsea power cable to the EMEC wave and tidal test site in Orkney.

As the first of its kind, EMEC provides test facilities for a wide range of technologies that can tap into the huge potential of wave and tidal renewable energy. Wave power alone has an estimated global potential of approximately 1,000 to 10,000GW — in the same order of magnitude as the world's electricity consumption, according to the World Offshore Renewable Energy Report 2004-2008 published by UK Renewables.

For more information, visit www.drakamog.com.

Portable Dynamic Riser, a Game Changer for Mobile Asset Communication

By Perry Wright - Director of Integrated Subsea Systems, OSI, Inc.

The Ocean Specialists, Inc. (OSI) patented Portable Dynamic Riser (PDR) system provides a step change in the communications capability of any mobile asset that is working on existing subsea oil and gas fields. No longer are these valuable assets and the work that they are employed to perform limited to high cost, low-bandwidth satellite, or microwave communication. The PDR provides the capability of direct fiber optic communication at data rates up to full gigabit Ethernet with multiple gigE channels available on a single fiber.

The PDR is a classically simple deployment system, using only proven deepwater components, that provides a direct fiber optic connection between a Mobile Offshore Drilling Unit (MODU) or other facility and an existing wet-mate connection point, typically an Umbilical Termination Assembly (UTA) that has a spare wet-mate fiber-optic connector available.

The PDR system provides the primary communication path between the mobile facility and the production platform, which provides the fiber connection to shore. The now secondary satellite or microwave system then provides back-up communications in the case of failure in the fiber network. With direct fiber communication, latency problems are removed and decisions on data priority are redundant.

The self-contained PDR system's small footprint and portability ensure that once one vessel has completed its in-field tasks, the system can be quickly de-mobilized, stored and as quickly and easily mobilized onto the next vessel that is working in the field.

Benefits

In recent years, the complexity of installation, maintenance, and workover operations has grown significantly, while the typical mobile asset with day rates in the many $100,000s often operate on more limited communications capability than the average U.S. home. The management and oversight of these operations has increased the burden on communications and control systems to the point where communications bandwidth is a limiting factor that must be accounted for in operations planning and day-to-day activities. In some instances, valuable real-time data waiting until bandwidth is freed up to enable transmission.

Direct fiber optic communication permits drilling, well intervention, and workover operations to be monitored in real-time from the host facility and/or a shore-based operations center where a high bandwidth connection between the facility and shore exists. Operators' independent programs have demonstrated the cost benefit of real-time communication to shore for facilities-based drilling and well maintenance programs. The PDR permits the extension of this documented savings to the valuable mobile assets performing this work in high value, deepwater operations.

For fixed facilities, the PDR provides a low-cost option to installing a permanent riser for infield work that may be intermittent or may not justify the cost of a dedicated riser and the loss of a riser slot on the facility. One scenario where this may apply is with Life of Field Seismic systems (LoFS). These systems are typically not in continuous operation and, when operating, require only limited power but high-bandwidth communication.

PDR System Description

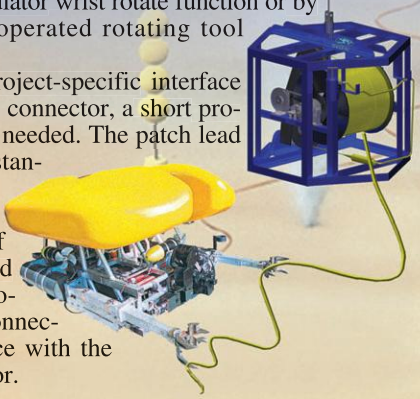
The PDR is made up of three main components; the Surface Launch and Recovery System (LARS), the Flying Lead Management System (FLMS), and the project specific wet-mate connector patch lead.

The LARS is a proven unit used for small ROV operations and comprises the power supply, control unit with video monitor, the main winch, A-Frame, and the 3,000m umbilical. The Lars provides control of the Flying Lead Management System and a means of deploying it to a set distance above sea floor and for its subsequent recovery.

The FLMS operates on the same well-established principles of an ROV tether management system. The components selection and design of the FLMS leverages off of 30 years of ROV technology. The FLMS uses only proven components and proven designs and includes a deployment frame, the flying lead cable reel with its motor, control and level wind, 1,500m of neutrally buoyant light-weight cable, and a cable termination with dry-mate connector.

The function of the FLMS is to allow an ROV to pull out the Flying lead cable in a controlled manner. The FLMS also recovers the Flying lead cable after use, properly storing the cable on the cable reel using a precision level wind. To further simplify the design and provide ultra high reliability, the FLMS is only powered during cable recovery. As a backup system should the cable recovery drive system fail, the cable reel can be operated by the ROV either by the manipulator wrist rotate function or by use of a hydraulically operated rotating tool onboard the ROV.

Finally, to provide a project-specific interface to any available wet-mate connector, a short project specific patch lead is needed. The patch lead will typically include a standard dry-mate connector to mate with the flying lead, a short length of cable or pressure-balanced oil-filled hose, and a project specific wet-mate connector configured to interface with the available mating connector.



PDR Deployment

The PDR is most suitable for fixed or mobile assets that will be on station for a period of a few weeks or longer. Identical to ROV operations, the deployment of the FLMS consists of over boarding the FLMS using the Launch and Recovery System (LARS). The FLMS is then lowered to operational depth as the umbilical is paid out. To aid in deployment and general operations, the FLMS includes onboard sensors that display data to the FLMS operator. These sensors include a water depth sensor and an acoustic altimeter that provides the FLMS height off bottom. The FLMS can also house an acoustic tracking beacon that can be tracked by the ROV system's navigation and acoustic tracking system. This allows the geodetic position and depth of the FLMS to monitored, recorded, and tracked at all times. The FLMS also houses a low-light wide-angle CCD camera and LED light to monitor the cable reel and level wind operations. Other than the onboard sensors, the FLMS is completely passive during deployment. While in the water, all the electrical power is monitored by ground fault sensors.

Once the FLMS is at the desired height off bottom, it is ready for the ROV to spool out the cable. The ROV will maneuver toward the FLMS using the acoustic tracking data to aid in navigation. Once the ROV captures the Flying lead, it maneuvers directly to the connection point on the in-field UTA.

As the ROV spools out the flying lead, the cable reel on the FLMS maintains back tension on the cable to prevent back lashing. A camera on board the FLMS monitors the cable pay out. The FLMS operator will be in communications directly with the ROV pilot in case an issue arises. When the ROV arrives at the connection point it will inspect both connectors and then mate the flying lead following the manufacturer's procedure.

To facilitate flying lead recovery, the ROV will position itself at the connection point, ready to maneuver towards the FLMS. The ROV will disconnect the Flying and holding it in front of the ROV with a heading towards the FLMS. The ROV will attempt to keep the cable off the seafloor. The FLMS operator will power up the FLMS and start reeling in cable, monitoring the cable pay in via the camera on the FLMS.

Once the Flying lead is recovered and stored, the FLMS can be recovered to the surface. The recovery process is the reverse of the deployment.

Conclusions

The PDR provides a low-cost method of making a very reliable, very high bandwidth direct fiber-optic connection between a surface facility, vessel or drill rig and a connection point on the seafloor. This optimum communication path can facilitate well intervention, work-over or other maintenance operations, or can provide a cost-effective method to communicate with or control subsea hardware for short-term, intermittent, or permanent deployments.

The PDR system is specified for 3,000m water depth and has a horizontal reach at the seafloor of over 1km. It is highly reliable using only proven ROV deployment technology and processes.

The PDR units will be produced by OSI's development partner, Seanic Ocean Systems, a leading producer of ROV intervention tooling, handling equipment, and engineered solutions for the deep water oil and gas industry (www.seanicusa.com).

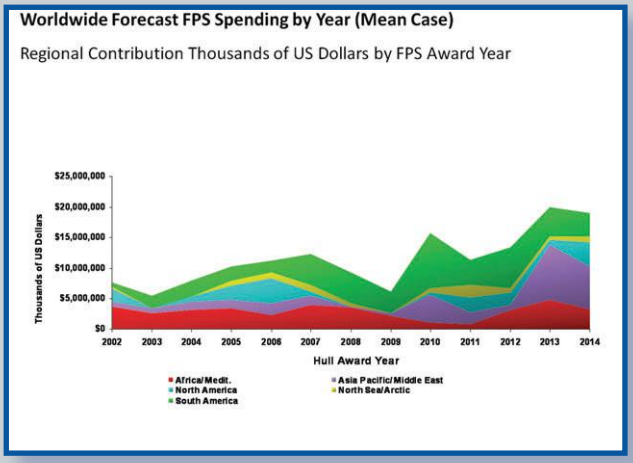
Since 2000, Ocean Specialists, Inc. has been a pioneer in the development of undersea fiber optic networks for the offshore oil and gas industry, providing the industry with new technology for the connection and deployment of undersea fiber networks, and supporting the technical and commercial planning and implementation of undersea networks for oil and gas operators worldwide.

For information visit www.oceanspecialists.com or contact OSI at contact@oceanspecialists.com.

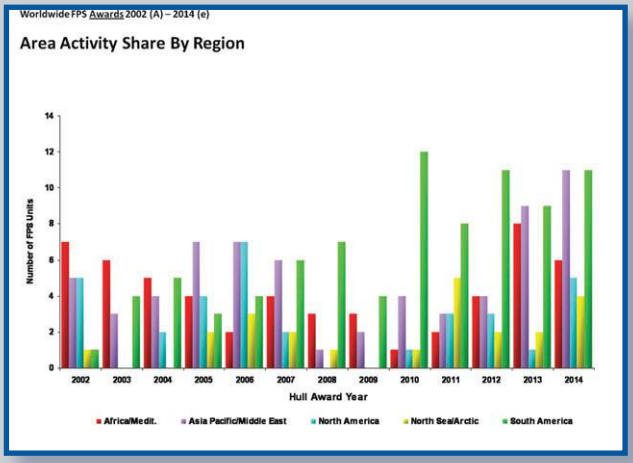
Offshore At-A-Glance

Quest Offshore Activity Report

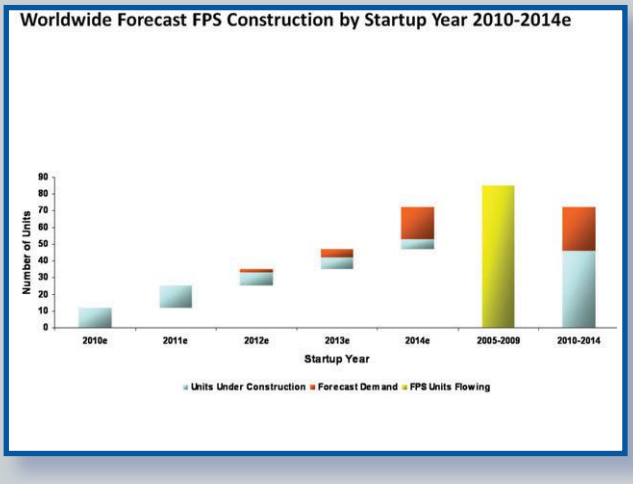
Worldwide Forecast FPS Spending



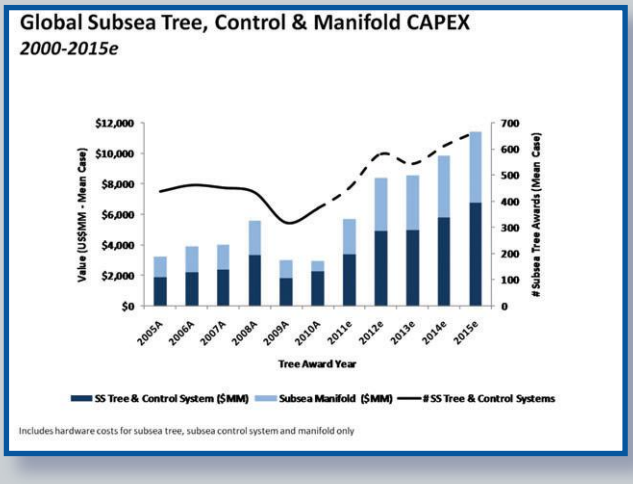
Activity Share by Region



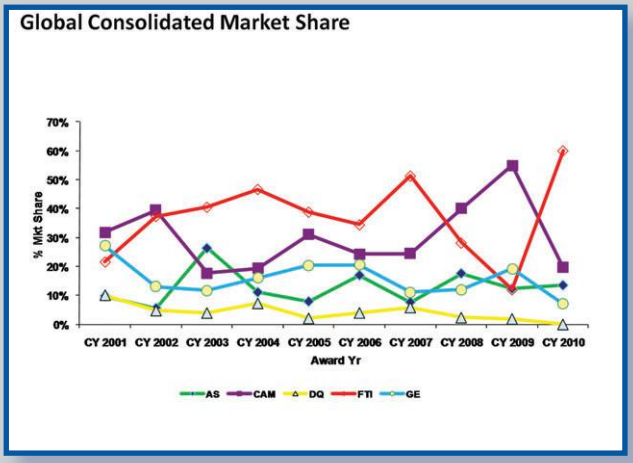
Global Forecast FPS Construction



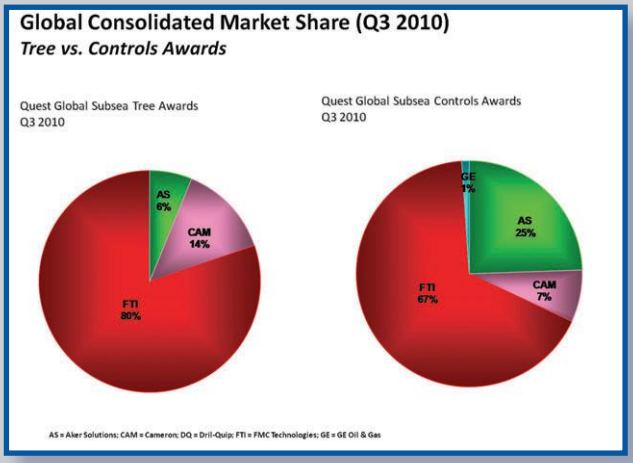
Global Subsea Tree, Control & Manifold



Global Consolidated Market Share



Worldwide Vessel Utilization



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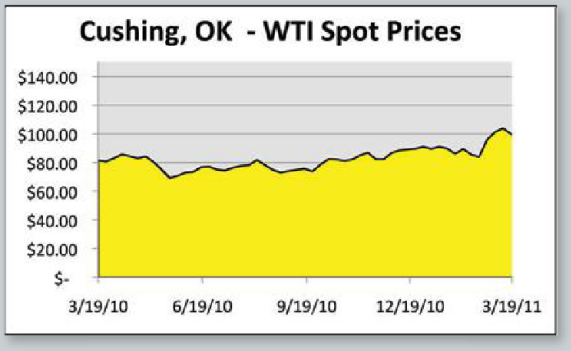
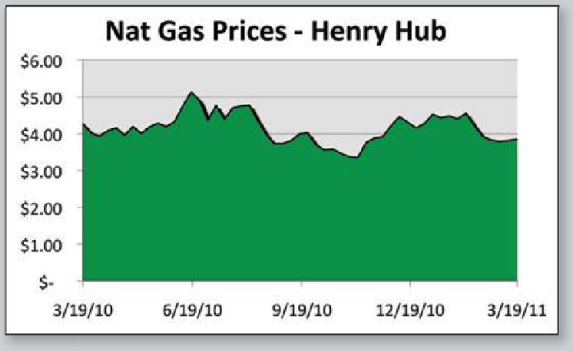
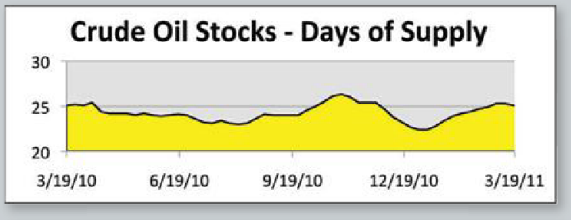
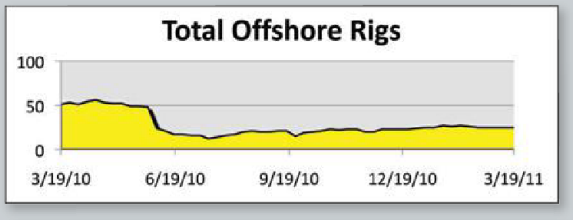
Oil & Gas Industry Trends

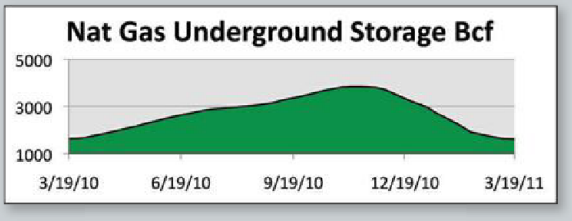
Monitoring the pulse of the US Offshore Oil & Gas Industry

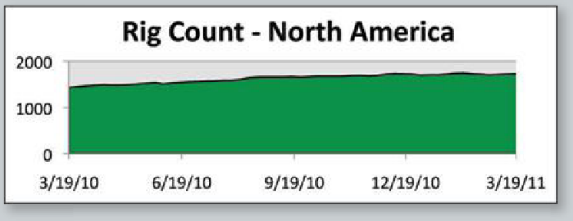










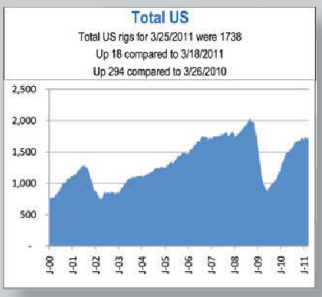


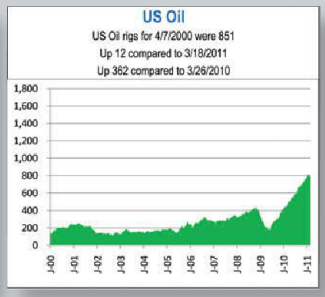
positive trend at least 3 weeks
changing trend < 3 weeks
negative trend at least 3 weeks

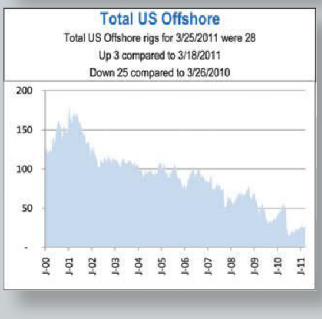
Baker Hughes Rig Report

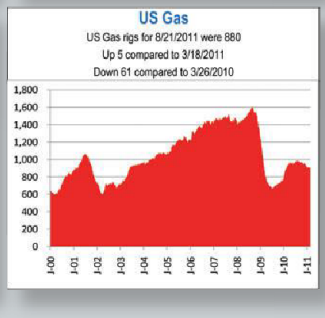
North American Rig Report
March 25, 2011

Location	Week of 3/25	+/-	Week Ago	+/-	Year Ago
Land	1690	13	1677	314	1376
Inland Waters	20	2	18	5	15
Offshore	28	3	25	-25	53
U.S. Total	1738	18	1720	294	1444
Gulf of Mexico	28	3	25	-23	51
Canada	429	-157	586	226	203
N. America	2167	-139	2306	520	1647









Gulf of Mexico Data

Current Deepwater Activity

Operator	Area/Block	OCS Lease	Rig Name	Prospect Name	Water Depth(ft)
Shell Offshore Inc.	AC 857	G17565	H&P 205	Great White	7,811
Eni US Operating Co. Inc.	MC 772	G24107	T.O. DEEPWATER PATHFINDER	Triton (mc)	5,413
Anadarko Petroleum Corp.	GC 726	G24184	T.O. DISCOVERER SPIRIT	Tonga	4,674
Anadarko Petroleum Corp.	GC 683	G18421	ENSCO 8500	Caesar	4,457
BHP Billiton Petroleum (GOM)	GC 654	G20085	T.O. DEVELOPMENT DRILLER I	Shenzi	4,383
Chevron USA Inc.	GC 640	G16770	T.O. DISCOVERER CLEAR LEADER	Tahiti	4,292
BHP Billiton Petroleum (GOM)	GC 653	G20084	GSF C.R. LUIGS	Shenzi	4,234
Shell Offshore Inc.	MC 809	G09883	H&P 204	Princess	3,800
Shell Offshore Inc.	MC 807	G07963	H&P 201	Mars b	2,945
Shell Offshore Inc.	GC 200	G12210	CAL DIVE Q-4000	Troika	2,672
LLOG Exploration Offshore, LLC	MC 199	G32301	NOBLE AMOS RUNNER	MC 199	2,465
Anadarko Petroleum Corp.	VK 826	G06888	NABORS P-10	Neptune	1,932
Chevron USA Inc.	VK 786	G12119	NABORS 87	Petronius	1,754
Eni US Operating Co. Inc.	EW 965	G12142	T.O. AMIRANTE	Morpeth	1,692
Stone Energy Corp.	MC 109	G05825	H&P 206	Amberjack	1,030
Energy XXI GOM, LLC	EW 948	G26226	DIAMOND OCEAN VICTORY	EW 948	730

Deepwater prospects with drilling and workover activity: 16

New Deepwater Activity

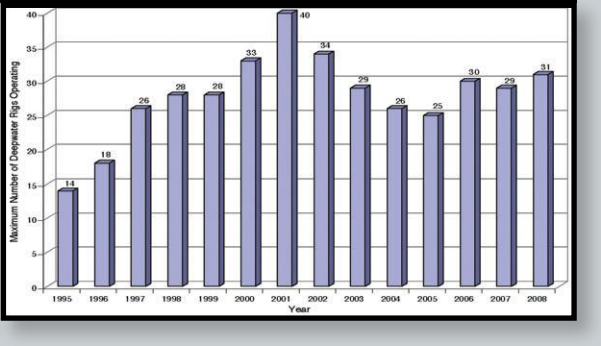
Operator	Area/Block	OCS Lease	Rig Name	Prospect Name	Water Depth(ft)
No activity since moratorium was lifted					

New Deepwater Activity as of Monday, March 21, 2011

Activity by Water Depth

Water Depth in Meters	*Active Leases*	*Approved Applications*	*Active*
0 to 200	*2,086*	*33,749*	*3,241*
201 to 400	*136*	*1,106*	*20*
401 to 800	*317*	*833*	*10*
801 to 1,000	*403*	*507*	*7*
1,000 & above	*3,389*	*1,643*	*26*

Rig activity by year



Activity by water depth Information current as of Monday, March 21, 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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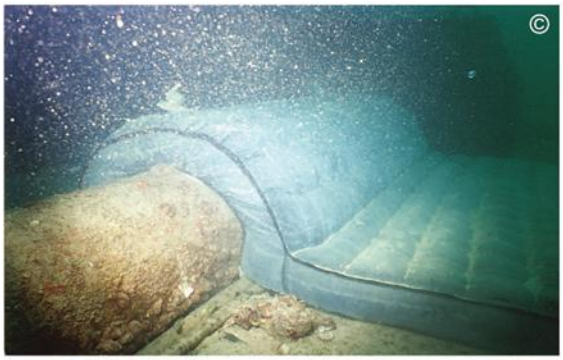

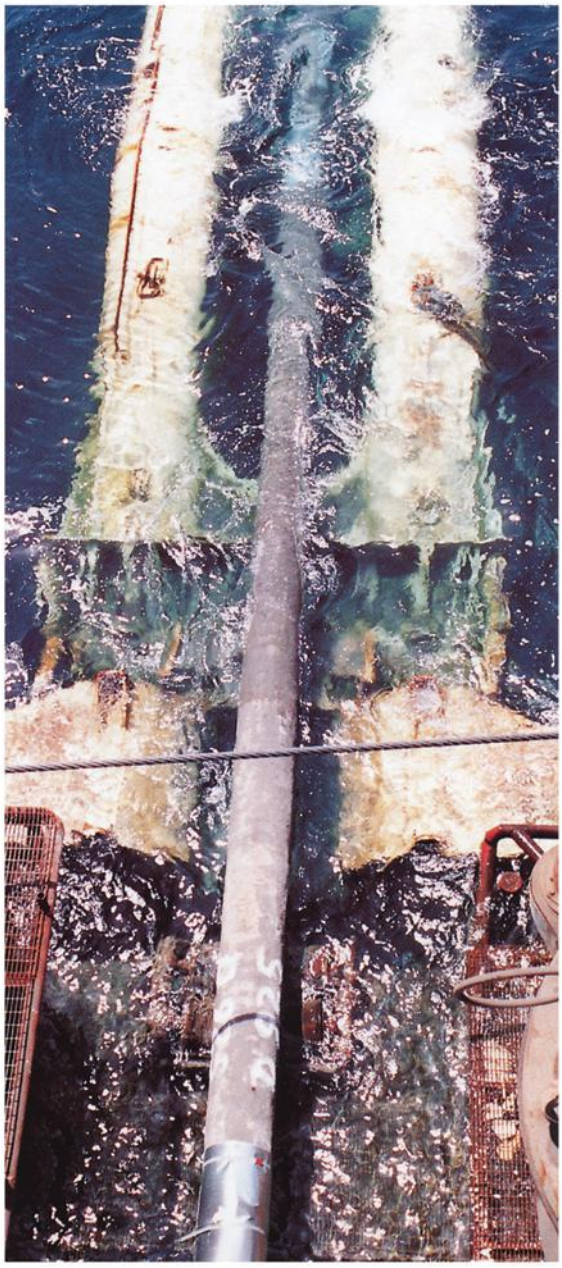

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Excerpts from

MUSINGS FROM THE OIL PATCH

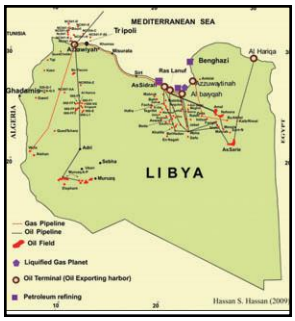
By Allen Brooks, Managing Director

PARKS PATON HOEPFL & BROWN
ENERGY INVESTMENT BANKING, LP

From the March 1, 2011 issue

Recession threat due to higher oil prices grows

The recent and growing civil unrest in Libya has raised the specter for an explosion in crude oil prices, the possibility of a supply cutoff and a potential global recession. These increasing fears come despite statements from Saudi Arabian oil minister Ali Naimi that the world is adequately supplied with crude and that his country stands ready to boost production to prevent a spike in world oil prices such as happened in 2008. He did acknowledge that recent oil price volatility will continue to be experienced in the near term but would fade as market participants recognize the large amount of surplus production capacity available to offset any supply shortfall coming from the problems of Libya's oil industry. At the present time, Libya produces about 1.6 million barrels per day, or about 2% of world oil supply. It is a major supplier of oil to Italy accounting for about 24% of that country's oil imports in 2009.



In addition, there is a major pipeline, Greenstream, from Libya to Sicily and then onwards to the Italian mainland that hauls natural gas from Libya. The pipeline supplies about 10% of Italy's natural gas demand. According to media reports early last week, Eni, the Italian oil and gas producer, has shut the pipeline due to the violence in Tripoli, but assured customers that it could still meet gas demand. The media was also reporting that western oil companies, including BP, Shell, Total and Suncor, to name just a few, had shut down their activities and were evacuating their employees and dependents from the country. The Nafoora oil field is reported to have been shut down due to worker strikes along with the Rus Lanuf oil refinery on the coast in the Gulf of Sirte. Repsol, the Spanish oil company, announced it had shut down the El-Sharara oilfield that pumps about 200,000 barrels per day, or roughly 13% of Libya's daily production.

Oil markets slow to react to Middle East turmoil

It is interesting that world oil markets were slow to react to the growing civil unrest and government protests throughout the Middle East until they arrived in Libya. Then oil prices started jumping. On Dec. 18, 2010, Brent crude oil traded at $91.67 a barrel when protests against the leadership in Tunisia first broke out. By the time Tunisian President Ben Ali resigned on Jan. 14, Brent had risen in price to $98.68. But oil prices then retreated to $95.25 on Jan. 25 when the protests first started in Egypt. Prices subsequently rose as the Egyptian protests grew, reaching $101.43 on Feb. 13, the day that Egyptian President Hosni Mubarak resigned. Oil prices rose the next day when violent civil protests erupted in Bahrain and Iran, but then actually fell when Libyan protests first emerged. On Feb. 22 when Eastern Libyan cities fell to protesters and gun fire was reported in the capital of Tripoli and Libyan Leader Moammar Gadhafi declared he would fight to the death against his opponents and threatened civil war to crush his opponents, Brent's price jumped to $106.26 a barrel, up 8%. In the U.S., the new April WTI crude oil futures contract closed up $5.71 a barrel at $95.42. Prices for both Brent and WTI were moving higher on Wednesday of last week when we wrote this article.

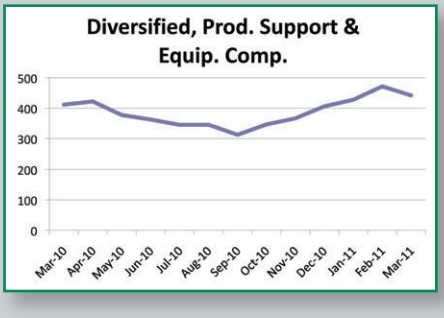
The biggest problem with the reduction in oil supplies as oil companies depart Libya is their impact on global oil markets and the potential impact on future economic activity. One analysis we saw pointed out that the jump in WTI prices since the end of the prior week to mid last week was the equivalent of a $0.13 per gallon increase in gasoline pump prices in the U.S. That will push the average gasoline pump price close $3.50 per gallon and in high-priced localities to $4.00 or more. We have found from previous studies that when gasoline pump prices breech the $3.50 per gallon barrier, driving is impacted as the cost of fuel takes a bigger share of consumer incomes. The $0.13 per gallon jump from higher crude oil prices was suggested to cost the typical American car driver $1,086 a year in additional expense, a not insignificant tax on consumer spending.

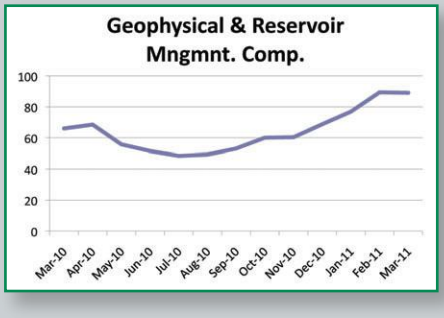
Recessions generally follow sharp jump in oil prices

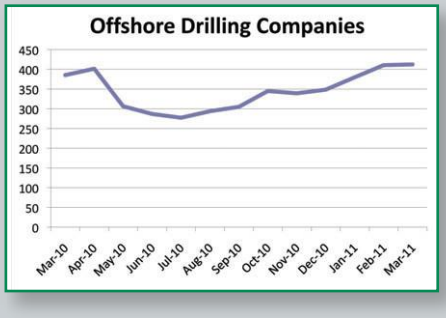
As can be seen, whenever we experience a sharp jump in oil prices, there tends to be a recession in the immediate future. Since the late 1970s there have been five official recessions with sharp increases in oil prices immediately before four of the five. Only the 1981-83 recession was marked by falling oil prices, but that recession was the result of sharply increased interest rates as the Federal Reserve, led by Paul Volker and supported by President Ronald Reagan, waged a successful war against inflation that had gotten out of hand during the 1970s. The question on economic forecasters' minds is whether the sharp rise in oil prices this time will also cause a recession. Some forecasters are calling for $200-300 a barrel oil prices as a result of the worst case political scenario for the Middle East. Other market experts suggest that there is a $10-15 per barrel risk premium in the current price of Brent crude oil for the worst case scenario, which could disappear if the unrest settles down. At the present time, forecasters are sanguine about the Middle East civil unrest spreading to key oil producers such as Saudi Arabia and Kuwait. But as Robert Mabro, president of the Oxford Institute for Energy Studies put it, "This whole event has been so surprising. I don't smell any danger in Kuwait, Saudi Arabia or Abu Dhabi, but things are so unpredictable you never know."

It is interesting to note that world oil prices in real dollars are now inching above the $40 per barrel level that helped trigger the two worst recessions since the Great Depression of the 1930s. Crude oil prices crossed that magical $40 per barrel threshold in late 1979 in response to the removal of Iran's oil supply from the world's market following the overthrow of the Shah of Iran's government, and then again in 2008 when speculation helped drive crude oil prices to $147 per barrel just before the financial crisis erupted causing a collapse in global economic activity. This is not a positive scenario if the violence in the Middle East continues or spreads and crude oil prices remain high or climb higher.

Monthly Stock Figures & Composite Index





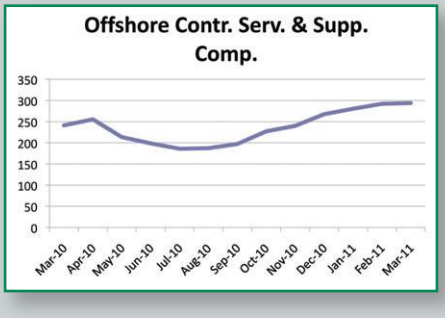


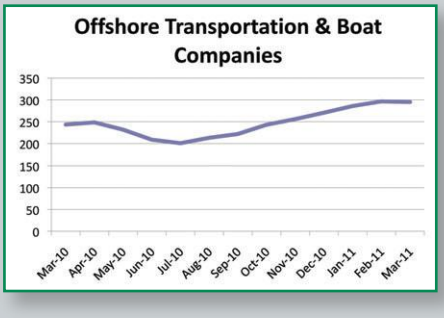
Industry Company Name	Symbol	Close *Mid-March*	Close *Mid-February*	Change	Change %	High 52 week	Low
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	68.41	70.52	-2.11	-3.0%	71.90	35.62
Cameron Intl. Corp.	CAM	59.60	58.76	0.84	1.4%	63.16	31.42
Drill-Quip, Inc.	DRQ	75.13	80.65	-5.52	-6.8%	83.80	40.38
Halliburton Company	HAL	44.14	47.94	-3.80	-7.9%	48.84	21.10
Tenaris SA	TS	45.30	48.11	-2.81	-5.8%	49.88	32.91
Newpark Resources, Inc.	NR	7.37	6.80	0.57	8.4%	9.50	4.77
Schlumberger Ltd.	SLB	85.63	94.49	-8.86	-9.4%	95.64	51.67
Superior Energy Services, Inc.	SPN	35.77	38.58	-2.81	-7.3%	39.73	18.02
Weatherford International, Inc.	WFT	20.54	25.62	-5.08	-19.8%	26.25	12.34
Deep Down, Inc.	DPDW	0.10	0.10	-	0.0%	0.29	0.05
Total Diversified, Production, Support and Equipment.....		**441.99**	**471.57**	**-29.58**	**-6.3%**	**488.99**	**248.28**
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	42.25	45.42	-3.17	-7.0%	50.81	20.05
Mitcham Industries, Inc.	MIND	11.20	11.23	-0.03	-0.3%	12.28	5.56
Compagnie Gnrale de Gophysique-Veritas	CGV	35.61	32.73	2.88	8.8%	38.12	16.42
Total Geophysical / Reservoir Management.....		**89.06**	**89.38**	**-0.32**	**-0.4%**	**101.21**	**42.03**
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	44.07	44.44	-0.37	-0.8%	46.54	23.71
Diamond Offshore Drilling, Inc.	DO	75.48	75.39	0.09	0.1%	93.42	54.70
ENSCO International, Inc.	ESV	55.60	53.06	2.54	4.8%	58.00	33.33
Nabors Industries, Inc.	NBR	26.98	27.98	-1.00	-3.6%	28.80	15.54
Noble Drilling Corp.	NE	43.45	41.99	1.46	3.5%	46.06	26.23
Pride International, Inc.	PDE	41.70	40.13	1.57	3.9%	42.91	21.51
Parker Drilling Company	PKD	5.63	4.70	0.93	19.8%	5.76	3.43
Rowan Companies, Inc.	RDC	40.82	39.51	1.31	3.3%	43.32	20.44
Transocean Offshore, Inc.	RIG	78.66	83.34	-4.68	-5.6%	92.67	41.88
Total Offshore Drilling.....		**412.39**	**410.54**	**1.85**	**0.5%**	**457.48**	**240.78**

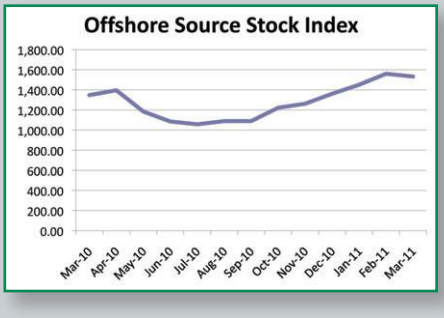
DISCLAIMER

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-March*	Close *Mid-February*	Change	Change %	High 52 week	Low 52 week
Offshore Contractors, Services and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	15.14	14.33	0.81	5.7%	17.00	8.38
Gulf Island Frabrication	GIFI	31.53	28.30	3.23	11.4%	34.68	14.18
Global Industries, Ltd.	GLBL	8.07	8.23	-0.16	-1.9%	9.18	4.05
McDermott International Inc.	MDR	23.51	23.79	-0.28	-1.2%	28.98	12.10
Oceaneering International	OII	81.82	81.71	0.11	0.1%	84.64	39.75
Subsea 7 SA	SUBC	23.72	24.17	-0.45	-1.9%	26.47	13.25
Technip ADS	TKPPY.PK	96.15	98.90	-2.75	-2.8%	103.61	56.65
Tetra Technologies, Inc.	TTI	13.95	12.65	1.30	10.3%	15.36	8.00
Total Offshore Contractors, Service and Support..……..		**293.89**	**292.08**	**1.81**	**0.6%**	**319.92**	**156.36**
Offshore Transportation and Boat Companies							
Seacor Holdings Inc.	CKH	93.94	95.78	-1.84	-1.9%	116.00	67.01
Gulfmark Offshore, Inc.	GLF	43.54	43.04	0.50	1.2%	47.31	23.83
Bristow Group	BRS	46.58	48.11	-1.83	-3.8%	52.39	28.32
PHI, Inc.	PHII	22.95	23.00	-0.05	-0.2%	23.55	13.15
Tidewater Inc.	TDW	61.15	61.15	0.00	0.0%	61.78	37.99
Trico Marine Services, Inc.	TRMA	0.07	0.13	-0.06	-46.2%	3.38	0.07
Hornbeck Offshore	HOS	26.91	25.01	1.90	7.6%	29.88	12.63
**Total Offshore Transportation and Boat ……..……..... **		**295.14**	**296.52**	**-1.38**	**-0.5%**	**334.29**	**183.00**
Total Diversified, Production, Support and Equipment		**441.99**	**471.57**	**-29.58**	**-6.3%**	**488.99**	**248.28**
Total Geophysical / Reservoir Management		**89.06**	**89.38**	**-0.32**	**-0.4%**	**101.21**	**42.03**
Total Offshore Drilling		**412.39**	**410.54**	**1.85**	**0.5%**	**457.48**	**240.77**
Total Offshore Contractors, Service and Support		**293.89**	**292.08**	**1.81**	**0.6%**	**319.92**	**156.36**
Total Offshore Transportation and Boat		**295.14**	**296.52**	**-1.38**	**-0.5%**	**334.29**	**183.00**
Total Offshore Source Index…		**1,532.47**	**1,560.09**	**-27.62**	**-1.8%**	**1,701.89**	**870.44**

Editorial Focus

Piracy—a Preventive Plan

By Ed Cargile

Piracy is nothing new. The illegal act goes back several hundreds of years.

The main source of income for the pirate is money. Pirates have three basic sources of money: the ship or boat, the cargo, and the crew. In most cases, the pirates will board a vessel to steal its cargo and rob its crew, then leave.

The problem is included in the opening stanza to the Marine Corps hymn … "From the Halls of Montezuma, to the shores of Tripoli, …"

Take one of the biggest areas for modern-day piracy, Somalia. The probability of getting a job in Somalia is zero. The probability of earning a million bucks in a hijacking is much greater.

The biggest difference between the pirates of old and now is that the latter are far better armed.

Pirates commonly focus their attacks mainly in the Caribbean, the Strait of Malacca, the South China Sea, and Africa.

There is some confusion about exactly what is piracy. The International Maritime Bureau (IMB) defines piracy as "the act of boarding any vessel with an intent to commit theft or any other crime, and with an intent or capacity to use force in furtherance of that act."

There is every indication that pirates will increase in the near future.

The success of significantly reducing piracy in the Malacca/Singapore Strait area in recent years has been maintained with only a few recorded attacks. A recent spate of attacks off the waters of eastern Malaysia/northwest Indonesia highlights the ease with which piracy can quickly return to areas where law enforcement efforts are reduced or missing altogether.

Piracy is a prevalent risk in the coastal regions of Nigeria, despite pronouncement of ceasefires between the MEND and government forces. The neighboring countries along the Gulf of Guinea are likely emerging piracy states.

There are lower levels of piracy across coastal areas of northern South American countries, mainly involving armed robbery of tourists. Peru had the highest reported piracy incidents in the region in 2008, all of which occurred in Lima's port, Callao.

Increasing unrest and the earthquake problems makes Haiti a likely future piracy hotspot. Increase in the organized narcotics-related crime in several Central American countries, the ready availability of fast boats and military-standard weapons to drug cartels, and the generally very limited capability of regional Navies provide an environment in which piracy could prosper.

With the exception of Somali and Nigerian piracy, where firearms are invariably used, the majority of piracy acts elsewhere in the world are committed using knives or machetes to intimidate the crews. The emerging use of firearms in some Latin American attacks is a negative future trend.

To give you an example, the following is a short example of the modern piracy:

On April 8, 2009, the Maersk Alabama was 240 nautical miles (440km; 280-mi.) southeast of the Somali Port of Eyl when she was boarded in an act of privacy by four Somali pirates. The U.S. flagged ship had a crew of 20 and was loaded with 17,000 metric tons of cargo bound for Mombasa, Kenya. The crew fired flares at the pirates, but the ship was successfully boarded. The crew then hid themselves, with the pirates taking the Captain hostage. The crew was led by Capt. Richard Phillips.

The crew had received anti-piracy training from union training schools and had drilled aboard the ship a day previously. Their training included the use of small arms, anti-terror, basic safety, first aid, and other security-related courses.

Four pirates held the master of the Maersk Alabama in a lifeboat. Aboard the lifeboat were three pirates and Capt. Phillips. The fourth pirate (Abduhl Wal-i-Muse) was aboard the USS Bainbridge negotiating a ransom and was taken into custody.

SEAL Team Six parachuted near the USS Halyburton. At the time, the USS Bainbridge had the lifeboat from the Maersk Alabama under tow, approximately 25 yards astern. On April 12, 2009, a group of snipers from the SEAL Team used Mark 11 Mod 0 (SR-25) sniper rifles to shoot and kill the three pirates aboard the lifeboat. Capt. Phillips was unharmed.

Abduhl Wal0i-Masi was brought to New York to face trial on charges, including piracy under the law of nations, conspiracy to seize a ship by force, conspiracy to commit hostage-taking, and firearms related charges. He pled guilty and was sentenced to 33 years, 9 months in prison on February 16, 2011.

On August 14, 2009, the lifeboat from this incident was donated by the owners of the Maersk Alabama for display at the U.S. Navy UDT-SEAL Museum in Fort Pierce, Florida.

Recently, four missionaries were taken hostage and killed by pirates off Somalia. They were two couples distributing Bibles. U.S. Central Command were in communication with the Americans aboard the captured large sailboat. Four warships that were trailing the sailboat (the S/V QUEST) when they heard gunfire. This was their first time U.S. citizens have been killed in a wave of pirate attacks.

Piracy has been long established in the countries bordering the southern Caribbean. Many attacks are armed robberies against tourist yachts. Peru had the greatest number of piracy indents in 2009 involving robbery from ships in Callao Port, while increasing lawlessness in Haiti and organized crime in Central America make these countries potential piracy hotspots.

U.S. Navy Photo by Mass Communication Specialist 2nd Class Mark Lagico

The risks of a piracy attack in the South China Sea is greatest of the Anambas and Pulau Mangkai islands.

The declining number of piracy incidents has been attributed to improved maritime security cooperation between the three littoral countries of Indonesia, Malaysia, and Singapore. In July 2004, Indonesia, Malaysia, and Singapore began coordinated patrols in the Malacca Straits. Patrols in the South China Sea are less frequent. Thailand joined this group in September 2008.

The Malacca Straights are bordered by Indonesia, Malysua, and Singapore.

Risks of piracy is greatest in waters off Mindanao and Basilan in the southern Philippines. The Philippine Moro Islamic Liberation Front and Abu Sayyaf continue to use piracy as a source of financing.

Robbery incidents in southern ports of Vietnam are likely to be the most significant risks to marine assets.

Piracy in the Bay of Bengal in Bangladeshi has declined and is likely to be limited to a modest threat of hijacking or crew kidnapping.

To Punish Pirates

Article 100 of the UN Convention of the Law of the Sea (UNCLOS) provides "(a)II States shall cooperate to the fullest possible extent in the repression of piracy on the high seas or in any other place outside the jurisdiction of any State."

In the United States, the Constitution expressly authorizes Congress to "define and punish Piracies and Felonies committed on the high Seas, and Offenses against the Law of Nations (Article 1, Section 8, clause 10)." High Seas is defined as those seas lie outside United States territory. Congress has the power to apply federal law beyond the borders of the United States.

The legal regime for dealing with piracy is well-established, both as a matter of international and domestic law.

The cost of capturing, trying, and punishing pirate puts a great strain on the country's judicial system and economic resources.

The Best Management Practices to Deter Piracy off the Coast of Somalia and the Arabian Sea Area (Version 3, June 2010) (http://www.marisec.org/piracybmp.htm) is the latest suggested planning and operational practices for ship operators and the masters of ships transiting the Gulf of Aden and the Arabian Sea. This detailed document is endorsed and contributed to by over 14 international organizations.

The Management Plan covers many important areas, including Somali Pirate Activity, Risk Assessment, Company and Masters; Planning, Prior to Transit, If Pirate Attack Is Imminent, If Boarded by Pirates, Incident Reporting and Updating Best Management Practices.

Future Prevention

More ships are patrolling than ever. More than a dozen nations are represented off Somali. But the world watched, some of the high-profile hostage situations.

Patrolling the waters of greatest piracy can only deter or respond to same attacks. It cannot stop them altogether. Even with many warships in the Somali area, the pirates are roaming an area as large as a million square miles, making it very difficult to find, track, and stop them from boarding ships.

The multinational task force (like the Combined Task Force 151, CTF-151) was established in January 2009. CTF-151 conducts counter-piracy operations in and around the Gulf of Aden, Arabian Sea, Indian Ocean, and the Red Sea to provide a lawful maritime order and develop security in the maritime environment.

U.S. Navy Vice Adm. William Gortney is the commander of the U.S. Fifth Fleet and U.S. Naval Forces Central Command. He also serves as the commander of the Combined Maritime Forces (CMF).

"To date, we have seen forces from the U.S., U.K., Canada, China, Denmark, France, Germany, Greece, India, Italy, Japan, Malaysia, The Netherlands, Russia, Saudi Arabia, Spain, Turkey, and Yemen."

In the western Pacific, the International Maritime Bureau (IMB) was created in 1981 by the International Chamber of Commerce to investigate and protect against fraud, stolen cargos, and missing ships. IMB's Michael Howlett said, "There was no place to report these crimes, and a lot of vital information was being lost."

The IMB established the Piracy Reposting Center (PRC) in Kuala Lumpur. The PRC is the only 24-hour, seven-days-a-week independent center of its kind in the world serving as a single point-of-contact for reports of piracy.

Below are a few technologies called a non-lethal means to combat the piracy-problem.

• New Piracy Countermeasures Security Seminar (GMATS, http://gmats.usmma.edu).

• M-Series Maritime Night Vision (FLIR, www.flir.com).

• Long Range Surveillance Camera ARGC-2400 (Obzerv, www.obzerv.com).

• Force 80 Water Cannon (Unifire, www.unifire.se).

• Anti-Piracy Service (Vessel Extractions, www.vesselextractions.com).

• Mobility Denial System (www.swri.org).

About the Author

Ed Cargile is an Engineer, Deep Submersible Pilot and Lockout Diver, Saturation Diver, Underwater Photographer, Writer and Consultant. He can be reached at ecargile@cox.net.

Preventive Measures

The methods of defense are in three categories:
- Adequate preparation and training
- A layered approach to defense.
- Equipping the vessel for defense.

Vessels defensive moves include:
- Develop and implement a Security Plan. Review the Security Plan with the local military unit.
- Pick someone to lead the shipboard defenses that has been under attack.
- Avoid danger areas.
- Register with country Navy, U.S. Navy, insurance companies.
- Great care must be discussed about arming the crew and carrying armed security guards.
- Ships should remove all low freeboard.
- A slow speed of advancement.
- Transiting high risk areas during early morning hours or operating the agreed upon transit lanes.
- Turning off Automated Information System (AIS) transponders.
- The ship should transit the high-risk area at the highest reasonable speed.
- Keeping a watchful look-out.
- Increasing lookouts.
- Maintaining communications with maritime security authorities,
- Varying routes.
- Carefully planning transits to avoid high-risk area.
- Removing external ladders.
- Rigging barriers.
- Rigging fire hoses to repel pirates.
- Hiring civilian armed security teams.
- The ship should check in with the naval forces in the area.
- Operate within the designate corridors.
- Participate in an organized convoy, if possible.
- Conduct regular counter-piracy drill, especially just prior to the ship entering high-risk waters.
- Install non-lethal devices, such as electric fencing, Long-Range Acoustic Device (LRAD), and remote-controlled fire monitors.
- Notify the owner, operator and naval authorities if approached by a threatening craft.
- If boarded, delay, disperse and disable ship equipment.
- Disable the ship so that the pirates cannot easily sail it.
- The crew should disperse, so they don't know how many crewmen are aboard.
- The crew should keep in touch through radio-telephone and sound-powered phones.
- And other tactics.

Providing half a century of powerful, elegant solutions trusted in the planet's most demanding environments

BIRNS, Inc. is an ISO 9001:2008-certified designer and manufacturer of unique lines of high-performance lights, connectors, penetrators and custom cable assemblies trusted for more than five decades in the commercial diving, subsea, and offshore markets. Whether illuminating the original findings of the Titanic, delivering highly complex, powerful connector systems for low-frequency active sonar (LFAS) military applications, or providing man-rated penetrators with inclusive ABS certification—BIRNS continues to find new ways to innovate and expand the boundaries of marine technology.

Experience Running Deep

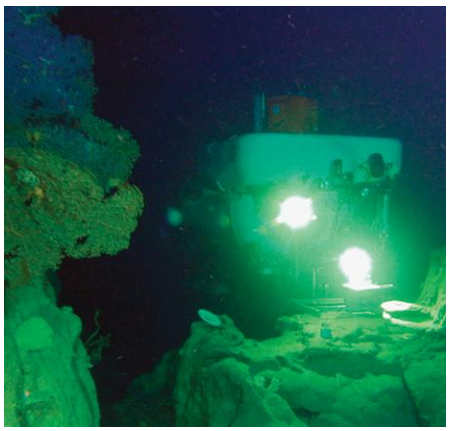
The company started out in 1954, creating underwater camera housings and then lights for the U.S. Navy, including specialty lights for the Man-In-The-Sea program. In the 1970s, BIRNS began manufacturing unique lights tailored for the extreme depths required in the growing offshore oil and deep-sea exploration industry—some rated to 13km. Other company milestones include the development of an exclusive double-ferrule electro-hydraulic connector adapter system for underwater electrical oil-filled cable applications, providing a seamless solution that eliminates the risk of cut tubing with underwater oil-filled cables for deep submergence ROVs.

Today, BIRNS develops, manufactures, and tests a diverse suite of industry-leading products, from the BIRNS Aurora™, a brilliant, extreme depth 14,000 lumen Light Emitting Plasma (LEP) vehicle light to high-density electro-optical hybrid BIRNS Millennium™ connectors rated to withstand open face hydrostatic pressure to 6km.

Advancing Connectivity

BIRNS began creating connector systems in 1988 to answer its own call for reliable, durable, high-performance connectors for its popular lighting products. The company went on to meet the changing needs of the rapidly evolving connector market and its growing requirements for unique hybrid solutions to provide greater bandwidth with less noise. BIRNS subsequently developed a series of complex connector lines that reliably transmit huge data streams while achieving the lowest optical losses (.2 dB) in the industry, available in both high voltage (≤3.6kV) and low voltage (≤600V) combinations.

The BIRNS Millennium series was designed specifically to provide the level of contact engagement needed in highly complex applications, like side scan sonar, telemetry, data acquisition devices, and high definition imaging, while also tailored for effective use by laymen without comprehensive fiber optic or connector training. The connectors provide elevated contact density, with 50 microns of hard gold contact plating (per MIL-G-45204, Type II, Class 1). Plus, BIRNS engineers its connectors to have exceptional performance attributes—while still being simple for technicians to work with—including molded o-ring lead-in chamfers and dual self-guiding stainless steel keys and keyways for positive indexing, for seamless installation and use in the field.



Testing the Waters

In addition to the company's advanced lighting and connector solutions that provide both brilliance and faster, more robust communication at greater depths than ever before, BIRNS also provides a wide range of comprehensive testing in its facility in Oxnard, California. Options include saltwater hydrostatic pressure testing (to 20,000 psi, per MIL-STD-1344), electrical testing (to 10kV), high volume helium testing, optical testing (per TIA/EIA-455-B), mechanical straight and side pull testing (to 16,000 lbs.), and numerous tests per UL requirements. In fact, the company recently received ABS Product Design Assessment (PDA) certification for all electrical penetrators and cable assemblies for underwater vehicles, systems, and hyperbaric facilities, which means that ABS has approved BIRNS' design, drawing, and test procedures for these elaborate systems.

BIRNS serves as an independent testing resource for the industry in addition to testing all of its own products on site. Now, thanks to the high-volume testing capabilities, BIRNS' man-rated penetrators can be ordered with inclusive pricing and lead times for ABS/DNV certification.

Looking ahead to a future as bright as one of its powerful LED work lights, BIRNS continues to expand the technological barriers of the marine market, providing solutions that allow comprehensive and effective exploration at depth.

Introducing a Modular Seafloor Communications Network

A pre-engineered, expandable system that can be deployed (and redeployed) anywhere in water depths of up to 3,000 meters.

The Offshore Communications Backbone (OCB)

CSnet's Offshore Communications Backbone (OCB) consists of a network of power and fiber optic cables and sensor ports connected to a surface communications buoy. The OceanNET™ buoy, was designed and built by Maritime Communication Services MCS, a subsidiary of Harris Corp. and serves as the command control and data backhaul for the OCB.

Expandable, Adaptable, Portable

- Each OCB or networked array of OCBs can be deployed to service multiple clients ...or dedicated to a specific project.
- *Once the mission(s) are completed, the OCB can be moved to a new location. The OCB is particularly suited to remote areas or areas located far offshore.*
- Suited both for long-term and short-term projects

Cost Effective

- The OCB represents a proven network module that has been designed, constructed and tested, eliminating upstart time and cost
- Each OCB module is expandable and can be configured to accommodate large or small applications at a predictable cost
- Networks that will ultimately be cabled to shore may be deployed and operated via the OceanNET satellite telemetry system while cable routes are still being negotiated

Typical Projects Served by the OCB

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

Finally, an End-to-End Service Provider

CSnet and its partners CSA International, Inc. (CSA), Ocean Specialists, Inc. (OSI) and Maritime Communication Services, Inc. (MCS) offer an end-to-end solution, providing system design and construction, site survey and selection, permitting, environmental impact and assessment, installation as well as ongoing operation and maintenance services.

OCB delivers the data collected to a 24/7 staffed Network Operations Center (NOC) for quality control, processing and forwarding to end-users *around the globe*

CSnet™ *In Strategic Alliance with:*

MCS MARITIME COMMUNICATION SERVICES
www.mcs.harris.com

OSI Ocean Specialists, Inc.
A Continental Shelf Associates Company
www.oceanspecialists.com

CSA CSA International, Inc.
A Continental Shelf Associates Company
www.csaintl.com

CSnet™
Modular Seafloor Communication Networks

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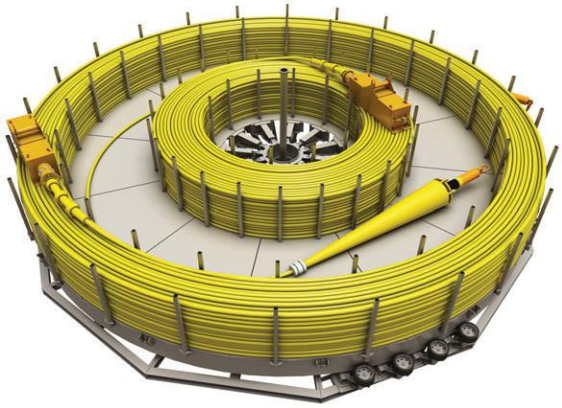
Melbourne Beach, Florida 32951
Telephone: 321-327-7915
www.CSnetIntl.com

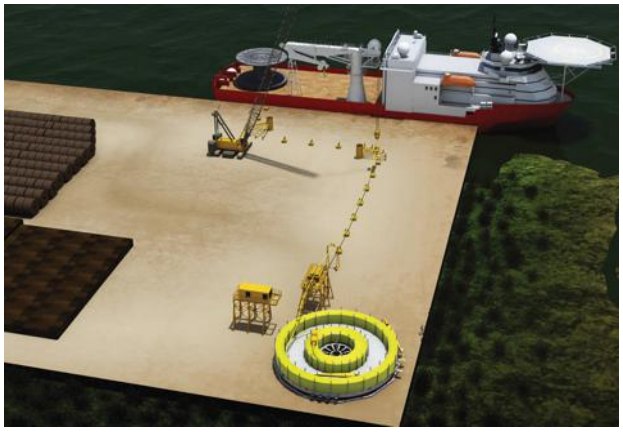
Deep Down introduces modular carousel



Recent developments in cable and umbilical storage and deployment technology have produced some novel and useful technology.

Deep Down, Inc., an oilfield services company specializing in complex deepwater and ultra-deepwater oil production distribution system support services, announced its scalable 1,000 to 5,000mt Carousel System (the "Carousel"), one of which is nearing completion and will soon be delivered to Core Industries ("CORE") deepwater port facility near Mobile, Alabama. This particular Carousel is rated for 3,400mt and is designed to be volume limited — where if a product can fit, it will be within the 3,400mt maximum payload.

At CORE's deepwater port in Alabama, Deep Down can provide customers with umbilical storage on its Carousel and vertical reels, which in turn provides substantial savings to the customer when mobilizing for an offshore job. The customer will be able to spool or carry umbilicals to the installation vessel while simultaneously loading out the vessel with the remaining requirements.



Deep Down will also be able to perform full-scale Systems Integration Testing ("SIT") and have installation equipment on site that supports the Carousel available for rent to installation contractors for immediate mobilization. It also has the equipment on site and the experience to test, flush clean, monitor, and even commission umbilicals by exchanging with the desired deliverable fluids before heading offshore.

The Carousel's flexible foundation has simple requirements for on and offshore use. Being scalable in increments of 500MT and holding up to 5,000mt the Carousel design is quite versatile and nearly limitless to the size of your project, dock, or installation vessel.

For more information, visit www.deepdowncorp.com.

Cable storage, transport and installation concept

As the subsea industry is moving into deeper and harsher environments, an experienced player is helping establish global standards with an intriguing concept. Based upon an innovated method of providing the transportation, installation, and storage of reeled products for the subsea industry, M-Reel has designed and developed an alternative approach to the standard reel methodology. Born from the need to help reduce transportation costs for customers, M-Reel provides a Modular Reel rental concept that, when empty, can be transported in standard ISO containers anywhere around the globe.

M-Reel was established in 2003 and has become the frontrunner in design and standardization of reeled product transportation and installation in the global marketplace. It leads the industry with heavy duty reels from 2.2m to 12.4m that are moved between locations in standard shipping containers. The modularity concept allows M-Reel to offer various payload classes, which can have various flange, drum, and width configurations to meet each customer's specific project needs.

The modularity of the reels enables rapid mobilization to any location offshore or onshore around the globe by M-Reel's specially trained crew.

For the transport, installation, or storage of umbilicals, M-Reel offers the 300 and 400mt payload classes. These reels have flanges of 8.6m, 9.2m, as well as 10.4m, 11.4m, and 12.4m configurations. The drum sizes are typically 5.0m, however, 4.0 to 7.0m are offered if needed. The width of the reels range from 5.0 to 7.0m depending upon the customer's umbilical needs and size capabilities.

In addition to the multiple reel configurations, dividers can be placed in five predetermined locations along the drum to suit the customer's product and end terminations. Since the reel components are not welded together, the use of bolts adds to the strength and flexibility of the modular reel design to best suit the customer's requirements.

M-Reels are designed with DNV Type Approved Certification for offshore installation and rated with Lifting Device ILO CG3 "Loose Cargo Gear" certifications. Each M-Reel is assembled and load tested to 1.1 SWL prior to leaving the manufacturing facility.

EvoLogics S2C acoustic modems provided multiple access to NDOCE ADCPs

EvoLogics GmbH reported that their EvoLogics S2C underwater acoustic modems provided data transfers from multiple asynchronously operating ADCPs using a single pair of modems deployed in the West Pacific for the Northwestern Pacific Ocean Circulation and Climate Experiment.

In January 2011, an Institute of Oceanology, Chinese Academy of Sciences (IOCAS) research vessel "Kexue 1" ("Science One") returned from a 52-day cruise in the West Pacific. The IOCAS team, among other tasks, has completed installing a mooring system that carries oceanographic instruments of the Northwest Pacific Ocean Circulation and Climate Experiment (NPOCE).

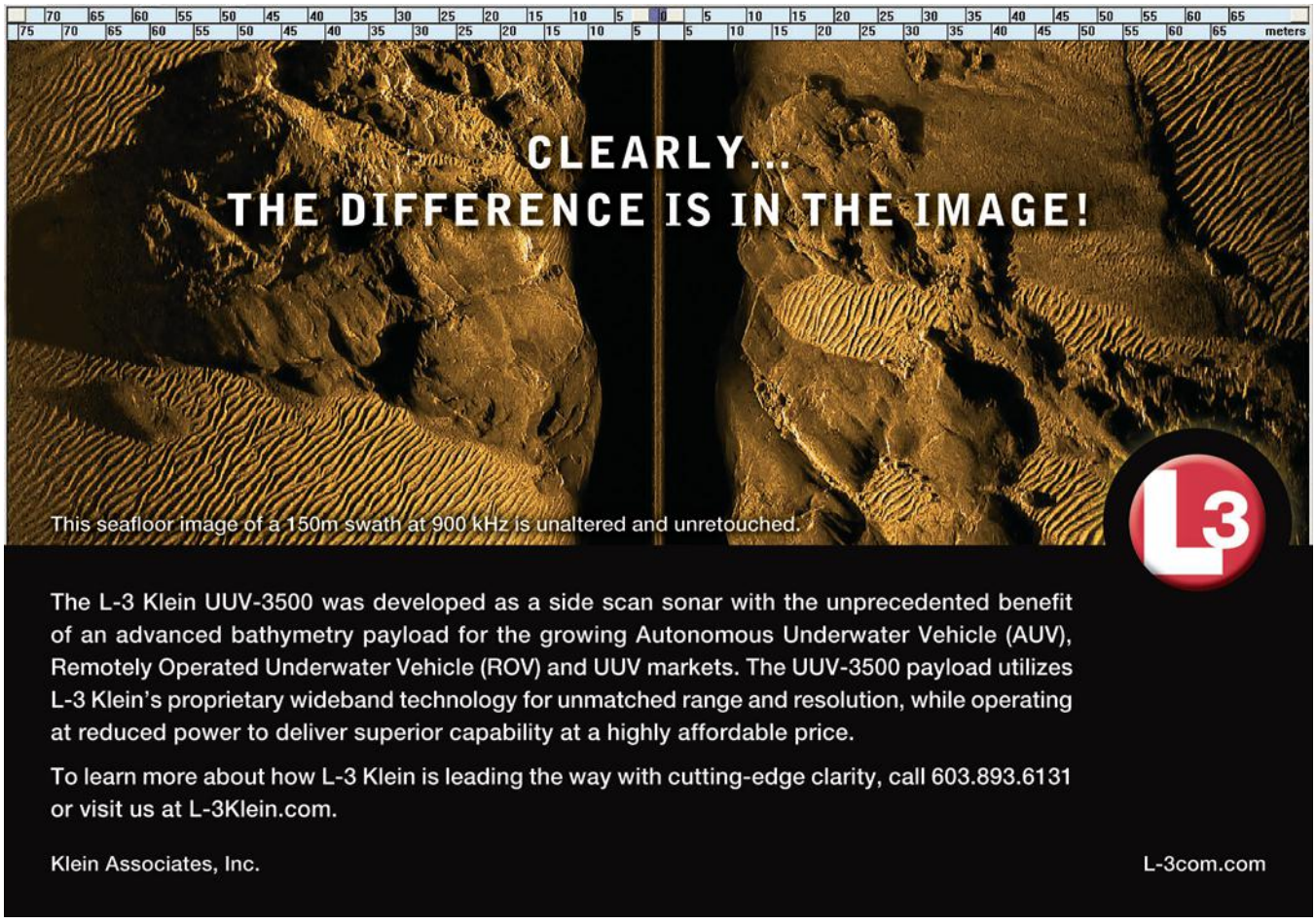
Initiated by IOCAS, the NPOCE is an international cooperative program aimed at studying the dynamics of Northwest Pacific (NWP) circulation and defining its role in moderating both regional and global climate systems. Joined by scientists from eight countries, the NPOCE program addresses the lack of *in situ* observations of the NWP circulation with deployment of long-term moorings, Argo floats, conducting hydrographic surveys etc.

The instruments, moored by the IOCAS team during the recent cruise, include two ADCPs that will collect valuable data about the Mindanao Current (MC) and the Mindanao Undercurrent (MUC) at 8° N. The ADCP-buoy now floats 400m below the surface, the depth on location being over 6,000m. The mooring system was designed and integrated by Laurel Technologies, a high-tech industrial company offering products for geophysical and marine research.

EvoLogics GmbH provided the IOCAS with S2C (Sweep Spread Carrier) underwater acoustic modems as an efficient solution for retrieving the collected ADCP information. Equipped with internal data loggers, both ADCPs are connected to a single acoustic modem for uploading the data to the surface.

Saving up the limited space, only one S2C modem is placed on the buoy. Fitted with an energy-preserving Wake-Up Mode, the downside modem only turns itself on when detecting encoded acoustic requests from the topside modem. Both S2C modems support asynchronous data transfers with user-adjustable priorities when handling data streams from multiple sources. Once an acoustic connection is established, this key feature allows for accessing each ADCP individually, initiating data retrieval or requesting status information.

Laurel Technologies, the main dealer of EvoLogics' products in China, provided technical support for S2C modems during the IOCAS cruise.



The IOCAS team reported successfully communicating to the ADCPs both immediately after deployment and upon return to the site 10 days after. Data collected during the 10-day testing was downloaded from each of the instruments. EvoLogics GmbH received positive feedback about the S2C modems' performance after the cruise was completed.

For more information, visit www.evologics.de.

Advanced OE14-408 underwater digital stills camera launched

Kongsberg Maritime will launch its most advanced underwater digital stills camera at the Ocean Business 2011 technology exhibition in Southampton (Stand N1) on April 5, 2011. The OE14-408 is the latest underwater digital stills camera to be revealed in Kongsberg Maritime's market-leading portfolio of underwater and harsh environment cameras and imaging systems.

The OE14-408 provides superb image and color quality and has a range of newly enhanced features over the previous OE14-208 model. These include 10 mega pixels per image (double the pixel resolution), improved color depth and dynamic range, Ethernet upload connectivity, a much faster flashgun refresh rate, and a more compact housing for ease of deployment. When used in conjunction with Kongsberg Maritime's new dedicated flashgun (the OE11-442), the camera offers accurate exposure control via through-the-lens (TTL) flash metering, resulting in striking image clarity. The flashgun recharge rate has been doubled, allowing improved productivity for inspection operations.

The OE14-408 has a 5 x zoom capability and is depth rated from 4,500m to 9,000m. Each image is framed and temporarily stored on the inbuilt 8GB Solid-State Storage. The images can be the uploaded "on the fly" via USB2 or Ethernet, meaning that they can be transmitted immediately to the surface or to shore — and viewed anywhere on the globe, therefore increasing operational efficiency of ROV or lander deployment.

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

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New Ethernet fiber optic multiplexer

Moog Components Group, a division of Moog Inc., has announced the introduction of a new expandable Gigabit Ethernet (GbE) fiber optic multiplexer. The Focal™ 907-GEM multiplexer provides four independent and switchless 10/100/1000 Mbps Ethernet links as well as expansion capability through a PC/104 connector. Typical applications are ROVs, video systems, and advanced sonar systems.

A key advantage of the Focal™ 907-GEM multiplexer is its low-latency switchless design needed for today's increased use of real-time Ethernet for critical control systems and digital video. This multiplexer significantly reduces size and total system cost when compared to standard media converter solutions as it replaces four separate Ethernet media converters with a single board and single fiber link.

In addition, support for non-Ethernet signals via expansion cards allows for expandable and reconfigurable multiplexer solutions. The 907-GEM can be stacked with up to six standard Model 907 expansion cards to add up to 48 additional data channels, including serial formats (RS-232/485), analog signals (sonar, ADC/DAC, audio), CANBus and other standard protocols.

The 907-GEM supports a wide range of optical options, including CWDM wavelengths and multimode configurations. As with the 907+ video/data multiplexer, the 907-GEM includes integrated diagnostics that are compatible with the Focal™ diagnostic interface card (907-DIAG-E) and graphical user interface (GUI) software for system health monitoring. The multiplexer offers an innovative, modular fiber optic telemetry solution that is well suited to Ethernet intensive applications.

For more information, visit www.moog.com.

New light emitting plasma light

BIRNS, Inc., has launched the most powerful, cutting-edge underwater vehicle

light on the market: the BIRNS Aurora™. This new high intensity Light Emitting Plasma (LEP) deep submergence light provides dazzling 14,000 lumen brilliance to usher in the next generation of extreme depth subsea lighting systems.

LEP is an exciting new lighting technology that is a more powerful and efficient alternative to LED, Tungsten Halogen, and Metal Halide lighting. Its light sources use a solid-state device to generate Radio Frequency (RF) energy to power a plasma light source. Unlike traditional metal halide lights, the BIRNS Aurora does not require metal electrodes to drive power into the source, thus has a more robust quartz vessel. This unique LEP light has a 30,000 hour lamp life, and produces a continuous spectrum, and delivers an exceptionally high lumen density—in fact, the single bulb (approxi-

mately 2mm long) produces a blazing 14,000 lumens of brilliant white light at 5,300K, at a Color Rendering Index (CRI) of 94.

The potent BIRNS Aurora offers physical dimensions that are smaller and more efficient than costly metal halide systems, and is engineered with a robust aluminum housing with a tempered 6km borosilicate glass lens. It has an overall length of just 11-in., and a housing length of 5.5-in., so it is immensely powerful, yet very low profile for a wide range of demanding applications. With a mounting diameter of 2.5-in., it can be tailored to fit large or small vehicles and runs on 28Vdc with a 9.3A power draw.

David Evans and Associates purchases two SeaBat 7125-SV2 to support high-demand NOAA charting requirements

David Evans and Associates Marine Services Division, a national leader in providing hydrographic, marine geophysical, and mobile laser scanning services has purchased two of the new SeaBat 7125-SV2 systems. DEA's clients include private industry, local and regional municipalities,

port authorities, the U.S. Army Corps of Engineers, and the National Oceanic and Atmospheric Administration (NOAA).

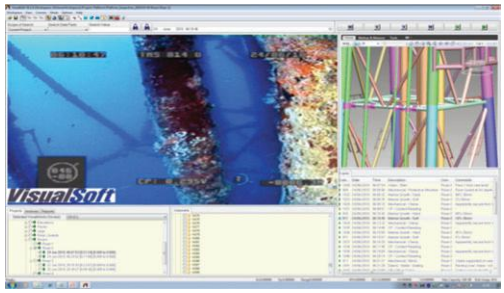
DEA is a long-time customer of RESON and was an early adopter of the SeaBat 7125. The upgraded 7125-SV2 system provides dramatically improved performance.

For more information, visit www.reson.com.

VisualSoft's VisualWorks 9.0 with 3D structural viewer

Forum Energy Technologies (UK) Ltd (FET) has announced that its Subsea Services business VisualSoft has launched VisualWorks 9.0, a major upgrade to their existing Pipeline and Structural Inspection Survey Suite.

- VisualWorks 9.0 introduces unique workscope support tools and a new integrated 3-D Structural Viewer across the entire range of online and offline products:
- Visual 3-D-Inspector adds inspection workscope planning and progress tracking seamlessly integrated with digital video acquisition controls and anomaly logging;
- 3-D Structural Viewer loads electronic drawings and provides two-way linking of components in asset models with the real video and all associated survey and inspection data for better visualization during analysis and reporting.onshore.



For more information, visit www.visual soft.ltd.uk.

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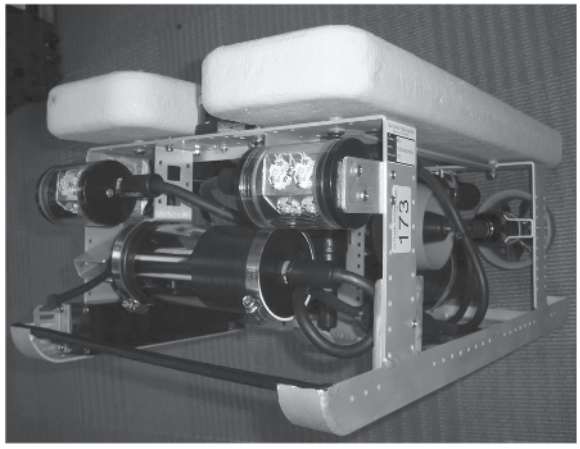
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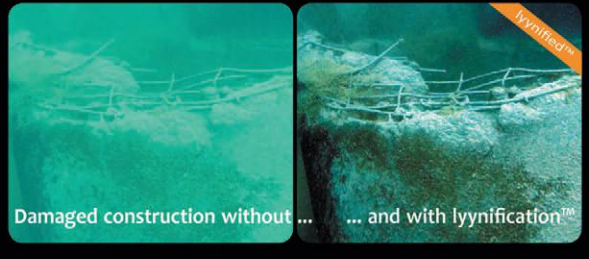

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WaveRadar Rex for offshore wave and air-gap measurements

WaveRadar Rex is a precision wave, air-gap, and sea level sensor with origin within the Rosemount Tank Gauge stable. With its control and ranging features specifically customized for the acquisition of wave and air-gap data, the microwave-based sensor is ideal for operation aboard offshore oil and gas platforms, offshore wind farm turbines, tsunami warning assemblies, and coastal monitoring stations. WaveRadar Rex is exclusively and globally distributed by RS Aqua Ltd from its base in Hampshire, UK.

WaveRadar Rex operates by sampling the distance between itself and the sea surface at 10 Hz to an accuracy of better than 6mm to distances of 50m. When operating in the range 50 to 65m, the accuracy is slightly reduced. Supporting accessories for the core product include a Mounting Frame and WaveView processing software. Some metocean system integrators have developed wave direction measuring techniques via the installation of multiple WaveRadar Rex units aboard a single structure.

For applications aboard moving structures, such as an FPSO, host vessel motion is removed via input from separate heave compensation sensors. Another common application for WaveRadar Rex is the acquisition of precision air-gap values via averaging of the distance data measurements.

Since introduction, sales have totalled in excess of 450 units, one from China for 5 x WaveRadar Rex systems for installation aboard platforms forming a pilot project for a coastline monitoring network. If trials are successful, a massive array of stations is planned along the Chinese coastline.

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

EGS is latest customer to select the new DELPH subsea mapping software

Marine survey specialist EGS International Ltd has become the latest customer for iXSea's DELPH subsea mapping software. The UK branch of the global EGS Group has purchased licences for DELPH Seismic and Sonar.

EGS will use the software to support marine survey operations in the UK and overseas in the oil and gas, marine infrastructure, submarine cable, and renewable energy sectors.

In response to the specific requirements of some projects, the company evaluated a variety of commercially available products and focused on their performance, cost-effectiveness, and ease of use selecting as the result of the process iXSea's DELPH subsea mapping software.

Dr. Walter Colautti, Manager of the Geoscience Section at EGS, says, "What particularly impressed us about the iXSea's software was its integrated nature (there is a highly consistent approach to data handling) and the simplicity of the user interface. These both help to reduce operator training demands and enable survey teams to get the most from the software very quickly."

Dr. Colautti adds that DELPH's real-time data processing capability has proved very popular with clients. "The ability to provide high quality preliminary deliverables (including interpreted seabed charts and seismic profiles) on board the vessel while the survey is progressing creates confidence in the quality of the data collected. Furthermore, this provides the opportunity to modify or extend the survey programme in response to the findings while the vessel is still on site, with obvious operational and cost advantages".

iXSea recently undertook a major redevelopment of its DELPH geophysical software suite based on a thorough reappraisal of users' needs. By stepping away from the existing products, the company has achieved advances in several areas that have resulted in not only improved image quality but also an all-together faster, easier-to-use and more versatile tool.

For more information, visit www.ixblue.com.

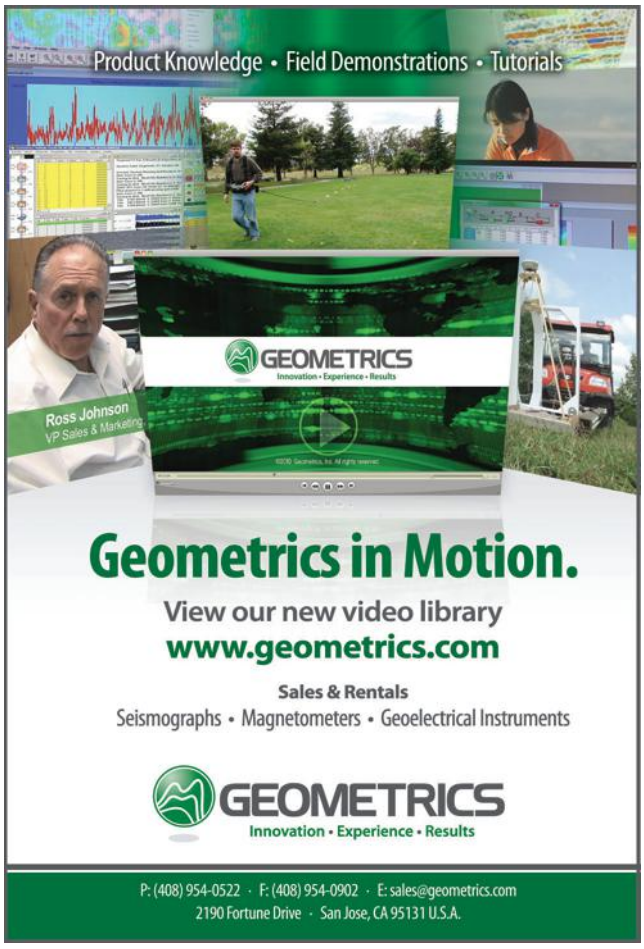
PDM launches new Omicron subsea fiber optic connector

PDM Neptec introduces Omicron, a compact, dry mate, single way fiber optic connector to the subsea market. Low loss, high performance, and rated for use to 5000m, Omicron is designed for single mode or multimode fibers with insertion loss performance of <0.5dB at 1,310nm and 1,550nm.

Omicron is competitively priced and available from PDM stock along with a full range of cables and underwater electrical connectors.

PDM has been at the forefront of harsh environment engineering for over 25 years. An exclusive distributor of Teledyne Impulse underwater connectors and cable assemblies, PDM also supplies high quality bespoke engineered connectivity solutions to customer requirements.

For more information, visit www.pdmneptec.com.



GeoEel Solid™ streamer

Geometrics Inc., has announced the shipment of their first solid digital seismic streamer, the GeoEel Solid™.

The customer is Japan Oil, Gas and Metals National Corporation (JOGMEC; President: Hirobumi Kawano) and the GeoEel Solid™ is part of a new marine research vessel valued at 17.3 Billion Yen ($207 Million USD).

The GeoEel Solid™ Digital Streamer offers superior electronics with a solid active section design that delivers higher quality data than ever before. The smallest diameter solid design available (only 44.5 mm), the GeoEel Solid™ is easy to deploy, easy to transport and can even be shipped by air. The unique solid design eliminates bulge waves, yielding ultra-low towing noise levels over a wide bandwidth.

This epoch-making new marine resources research vessel is scheduled to be in service in February 2012. It will be the first research vessel in Japan equipped with two types of large-scale drilling machines, which are selectable depending

on the submarine geological features of interest, together with a large variety of geophysical survey devices. In addition to surveys for seafloor mineral resources, such as seafloor massive sulfide (SMS) and cobalt-rich crust deposits, the new research vessel is intended to survey for energy resources such as methane hydrates.

For more information, visit www.geometrics.com.

Integrated HYDRALIGHT/OPTI-CON

SEACON Advanced Products, LLC of Bellville, Texas is pleased to introduce a new HYDRALIGHT Optical wet-mate configuration integrating a dry-mate OPTI-CON connector directly for termination. This latest design provides a number of advantages:

• Allows a quick and simple hook-up of

the HYDRALIGHT via the OPTI-CON dry-mate connector in the field before deployment.

• Allows the flexibility of selecting different cables or PBOF hoses during the design phase that terminate to the much simpler and standardized Opti-Con connector.

• Modularity allows quick change out of either system for maintenance or repair.

Once connected topside, these systems can be installed underwater by diver or ROV.

For more information, visit www.seacon-ap.com.

Ocean News & Technology

2011 EDITORIAL CALENDAR

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

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

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

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

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

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

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

September
Editorial: Offshore Wind
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
Distribution: LAGCOE • MAST Americas • Clean Gulf Offshore Communications
Deadline: September 16th
Product Focus: Acoustic Modems, Releases & Transponders

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

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TSC
Technology Systems Corporation

T. Jay Collins plans to retire from his position as president and chief executive officer of Oceaneering International, Inc., immediately following the 2011 Annual Meeting of Shareholders, which is scheduled to be held on May 6, 2011. **M. Kevin McEvoy**, Oceaneering's executive vice president and chief operating officer, is designated to succeed Collins as president and CEO. McEvoy has been with Oceaneering for 32 years, serving since late February 2010 in his current position. He started his offshore career as an officer in the U.S. Navy working in the areas of diving, salvage, and submarine rescue. During his tenure at Oceaneering, he has held a variety of progressively more responsible domestic and international positions in marketing, administration, and operations.

The Marine Technology Society (MTS) is pleased to announce **Jerry Boatman**, Ocean Science and Technology Director of QinetiQ North America, has assumed his new duties as Society President. Boatman, of Stennis Space Center, Miss., will serve a two-year term. Drew Michel, owner and principal consultant of ROV Technologies, Inc., Houston, Texas, also assumes his responsibilities as the Society's President-Elect. Former President Liz Corbin, Kaneohe, Hawaii, now serves as Past President on MTS's Board of Directors.


Boatman

In response to the growing need for the development and application of technology throughout various business lines and subsidiaries, Continental Shelf Associates, Inc. (CSA) has established a new position of Chief Technology Officer (CTO). **Dan White**, president of Technology Systems Corporation, a CSA company, will fill the position immediately. CSA's marine environmental, subsea consulting, submarine telecom and product development business lines demand the latest technology available, and the effort to maintain a leadership role is constant. "We're very lucky to have Dan White available to fill this position. With over 35 years experience in the subsea engineering industry, including multiple lead roles in AUV, ROV, and subsea system developments, there are few individuals with comparable capabilities." stated Kevin Peterson, CEO of CSA, "Dan will help CSA stay at the forefront of technology in all of our endeavors." The CTO position will be at the Continental Shelf Associates, Inc. (holding company) level, supporting CSA International, Ocean Specialists Inc, and Technology Systems Corporation as well as the company's various minority subsidiaries.

Buccaneer Energy promoted **Andy Rike** to executive vice president of operations for Buccaneer Resources and Buccaneer Alaska. Rike has been with Buccaneer since June 2008 as manager of operations. In his new position, he will be responsible for all of Buccaneer's field operations in the Lower 48 as well as Buccaneer Alaska operations for both onshore and offshore activities in Alaska. Rike was formerly with Gulf Oil, Chevron and Schlumberger. For the last 31 years he has worked extensively both onshore and offshore. He has tackled assignments in Alaska's Cook Inlet, France, Dubai, Saudi Arabia, the Rocky Mountains, Texas, Louisiana, South America and the eastern United States.


Rike

McDermott International, Inc. said that **Mary Shafer-Malicki** was appointed to McDermott's board of directors, effective Feb. 17, 2011. Shafer-Malicki also will serve on the company's finance and compensation committees. Shafer-Malicki retired from BP plc in 2009 after over 25 years of service with BP and its predecessor, Amoco.

International learning and skills provider Atlas Interactive appointed a new head of global marketing to spearhead its international marketing strategy as it embarks on an ambitious growth plan. Delivering innovative compliance and competency e-learning to the global oil and gas industry, **Simone Barnett** joins at a pivotal time for the company as it initiates a move into new geographic locations and market sectors. Barnett will be supported by **Michelle Farquhar** who after 10 years with the company was promoted to the post of marketing executive and will be responsible for the marketing plan, events, and exhibition management.


Barnett

Peter D. Kinnear will be succeeded by **John T. Gremp** as president and chief executive officer of FMC Technologies, Inc., effective March 1, 2011. Additionally, Gremp joined the company's board of directors. Kinnear will continue in the role of chairman of the board until October 31, 2011, at which time Gremp will assume the additional role of board chairman. Gremp was appointed president and chief operating officer of FMC Technologies in April 2010. During his 35-year career, he held a variety of management roles, recently serving as the executive vice president of Energy Systems in 2007 and vice president of Energy Production in 2004.

EOC Ltd., a provider of offshore oil and gas support services in Asia, appointed **Jon Dunstan** as its new chief operating officer, effective March 1, 2011. With over 17 years of industry experience, Dunstan, 39, began his career as a structural engineer and joined London Marine Consultants (LMC) in 1998. He was subsequently appointed its managing director in 2008. While at LMC, he was instrumental in expanding its range of capabilities and services as well as stepping up its operations and human resources. After LMC's acquisition by Ezra Holdings Ltd., Dunstan also took on a senior strategic consultancy role. He helped Ezra establish its FPSO division in the global arena through the provision of strategic and specialist advice during project-bidding and business development phases.

Apache Corp. appointmented **Rod Eichler** to president and chief operating officer and **Roger Plank** to president and chief corporate officer. **John Crum**, who served as co-chief operating officer and president – North America, is leaving the company to become chief executive officer of Midstates Petroleum, a privately held exploration and production company. In his new role as president and sole chief operating officer, Eichler will be responsible for Apache's 10 operating regions, worldwide drilling, gas monetization, and worldwide projects. Plank is assuming responsibilities for marketing and corporate purchasing in addition to his management role in finance, administration, and business development.

Red Spider appointed **David Allan** as chief operating officer to complete its management team. Allan has worked for more than 17 years in the oil chemicals sector, most recently as operations manager at Intertek Testing Services. In the role, he was involved in the significant growth of the Aberdeen, Scotland business over a 6-year period with the company. A Robert Gordon University graduate with a young family, he has also


Allan

recently qualified as a chartered chemist. Red Spider's first product eRED was a downhole computer controlled valve that can be opened and closed by remote control, without the need for intervention or control lines, saving time, money, and removing risk.

Transocean Ltd.'s board of directors is recommending that its shareholders approve at the 2011 Annual General Meeting the election of **Steve Lucas** as a Class III director for a three-year term. Lucas is the retired group finance director of National Grid plc and previously served in a variety of finance roles with the Lattice Group plc., the BG Group plc and Royal Dutch/Shell. As previously announced, the board recommended that the company's shareholders at the 2011 Annual General Meeting approve: the re-election of **Ian C. Strachan** and **Martin B. McNamara** as Class III directors for three-year terms; the election of **Jagjeet S. Bindra** as a Class III director for a three-year term; and the election of **Tan Ek Kia** as a Class I director for a one-year term. The 2011 Annual General Meeting, which will open to shareholders of record as of April 26, 2011, will be held at 4 p.m., CET, on May 13, 2011, in Cham, Switzerland.

Mustang, a Wood Group company, said **Curt Watson** joined Mustang's executive management team as senior vice president of global business development and marketing. Watson will provide global and domestic leadership of Mustang's business development and marketing efforts. In this role, he will provide direction in establishing best practices and coordinated approaches to key customer accounts on a worldwide basis, enhancing the ability to win work. Watson has over 30 years of engineering and construction expertise in the oil, gas, and chemicals industries.

Watson

ORBIT Communication Systems, Ltd., a satellite communications, tracking and telemetry, and communications management systems provider, said that **Yosi Albagli** was appointed to the position of executive vice president and president, Satellite Communications (SatCom) Business Unit. ORBIT's Satellite Communication Business Unit offers a wide portfolio of stabilized satellite communications solutions for maritime and land-based applications. In 1994, Albagli founded Tdsoft Communications, a provider of access telecom systems, and served as its president and chief executive officer for 11 years. Following Tdsoft's reverse merger with VocalTec Communications in 2005, Albagli continued to serve as president and chief executive officer of VocalTec until 2008. Prior to joining ORBIT, Albagli was chief executive officer of CTWARE Ltd., a startup in the area of cloud-based contact center applications. ORBIT's systems are installed on more than 3,300 maritime platforms.

Cape Cod-based Woods Hole Group is pleased to announce an important addition to its company. Environmental scientist **Jerry J. Cura** will be joining Woods Hole Group in late March as a Senior Environmental Scientist.

Tentec, a leading supplier of bolt tightening solutions for industry is pleased to announce the appointment of **I.E Power** as its new distributor in South Korea. With a strong engineering base, the company is well experienced in the supply of industrial products and places a particular emphasis on energy and environmental equipment.

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Calendar

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Ocean Business
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April 25-29, 2011:
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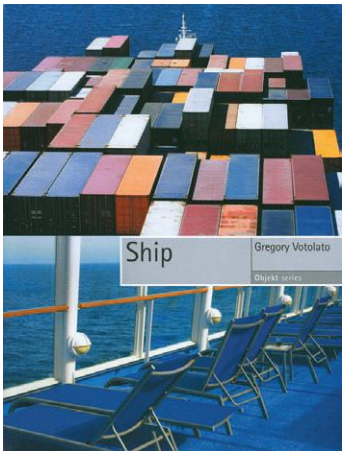
Media Reviews

Ship

Ship by Gregory Votolato. From oar-powered quinqueremes to steam-powered freighters to luxury ocean liners such as the Titanic to aircraft carriers like the Abraham Lincoln, ships have played an integral role in trade, transportation, and war throughout history.

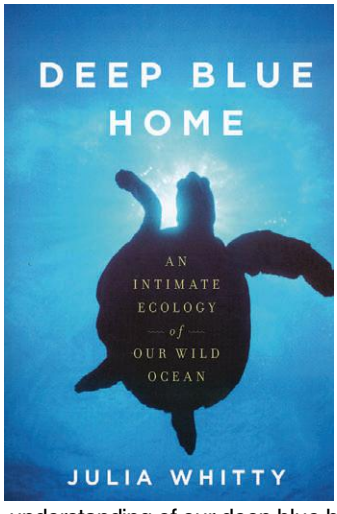


Today, ships remain the largest and most expensive moving objects on the planet; engineers and designers constantly push the limits of design, creating vessels that continue to rival newer technologies such as airplanes and cars. But, unlike other more common modes of transportation, the great ships of the world travel in the deep oceans, out of sight and out of mind—until, that is, something goes wrong. In Ship, Gregory Votolato explores the fiction and the reality of modern ships, the technology that creates them, and the events that can lead to disasters such as the Exxon Valdez and Amoco Cadiz. Here, Votolato delves into the world of the ship, describing the unpredictable and often-hostile environment of weather at sea, the resurgent threats posed by pirates, and the responsibilities of captains and crews onboard. Ship's broad overview of technology and design also offer unique insights into this extraordinary result of human creativity. Votolato's book will appeal to readers interested in the general design history of ships as well as their social, political, and technological impact on our modern world.

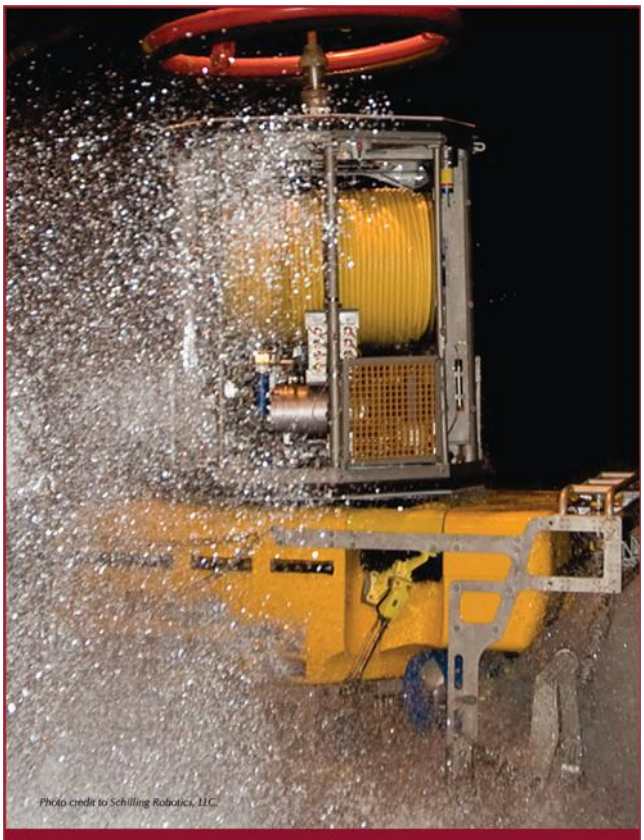
ISBN 978-1-86189-772-5, The Univeristy of Chicago Press, publication date 31 January, 2011, 303 pages, $27.00.

Deep Blue Home

Deep Blue Home by Julia Whitty. At the center of Deep Blue Home — a penetrating exploration of the ocean as single vast current and of the creatures dependent on it — is Whitty's description of the 3-D ocean river, far more powerful than the Nile or the Amazon, encircling the globe. It's a watery force connected to the Earth's climate control and so to the eventual fate of the human race. Whitty's 30-year career as a documentary filmmaker and diver has given her sustained access to the scientists dedicated to the study of an astonishing range of ocean life, from the physiology of "extremophile" life forms to the strategies of nesting seabirds to the ecology of "whale falls" (what happens upon the death of a behemoth). This book provides extraordinary armchair entree to gripping adventure, cutting-edge science, and an intimate understanding of our deep blue home. thing goes wrong.



ISBN 978-0-618-11981-3, Reaktion Books, The Univeristy of Chicago Press, publication date 9 July, 2010, 256 pages, $24.00.



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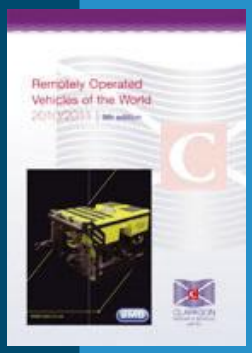

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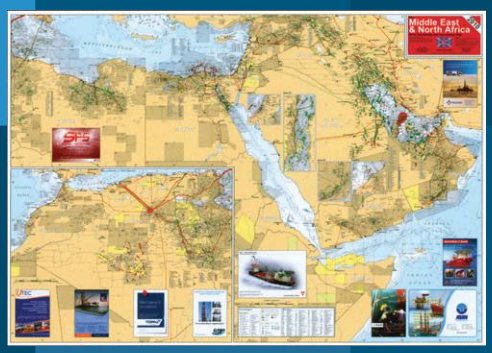

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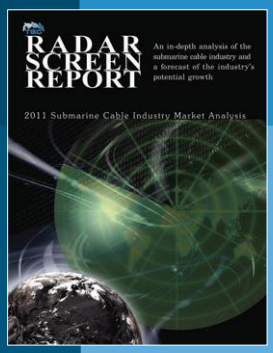

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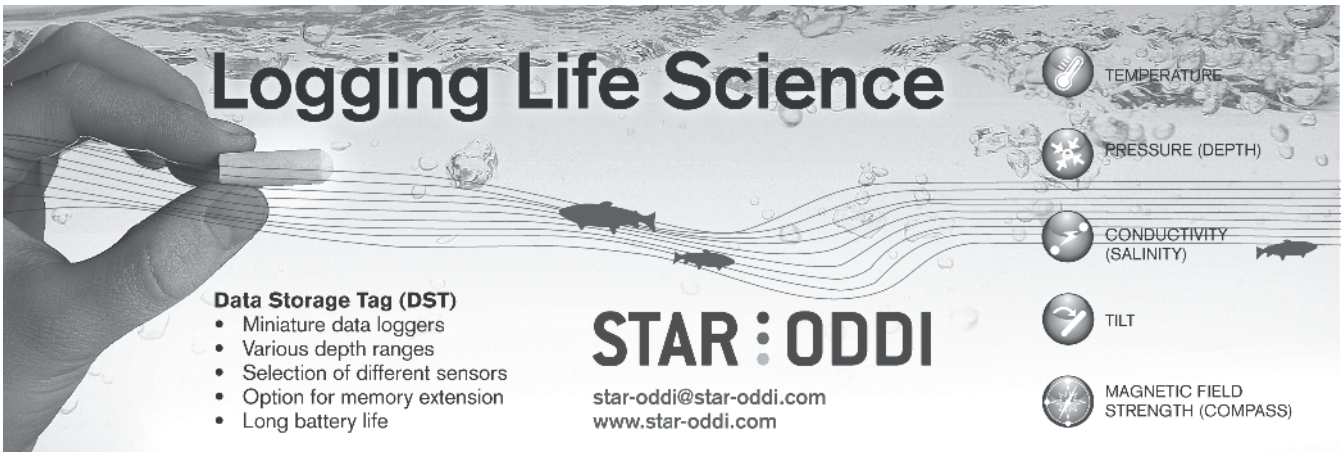
Issues Analyzed: Jan/Feb 2011 / March 2011

	Jan/Feb	March
Printed:	23,686	23,957
Mailings		
U.S.	21,020	21,220
Intl.:	1,661	1,682
Show Distr.:	400	800
Others:	350	320
Digital Circ.		
U.S.:	839	940
Intl.:	606	587
Ave. Circ. Print:		**22,791**
Ave. Circ. Digital:		**1,486**

I certify that all of the information provided on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form may be subject to criminal sanctions and/or civil sanctions.

Dan G. White, PublisheDate: 03/30/11



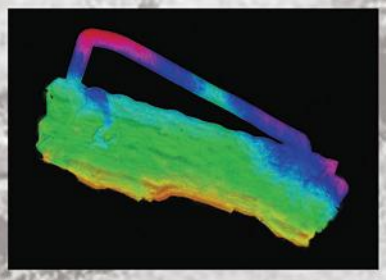
Turn-key Survey Solutions

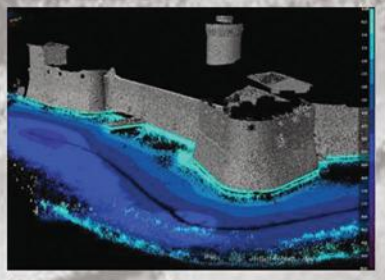
S-E-A

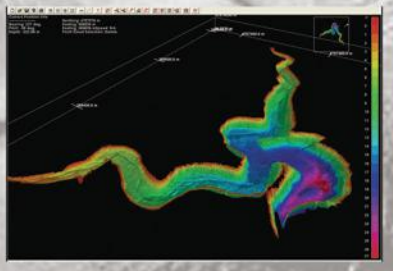
SWATH *plus*

SHARK MARINE TECHNOLOGIES INC.

Co-Registered Side Scan and Bathymetry







15 - 20 Times Water Depth

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

ROV's

Survey

Video Systems

Defence

Tether Management

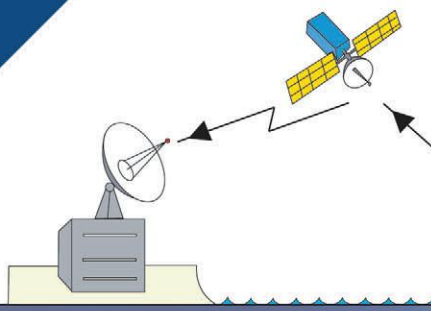
www.sharkmarine.com
sales@sharkmarine.com

Phone 905 687 6672
North America 1 877 99 shark

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

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

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



IMM

Inductive Modem Module

SBE 37-IMP-IDO

CT(D)-DO Recorder with Integral Pump

ICC

Inductive Cable Coupler

CTD-DO

CT-DO

CTD

CT

CTD

T

CT

TD

SBE 39-IM

T(D) Recorder

SBE 37-IMP

CT(D) Recorder with Integral Pump

Third party instrument with integrated IMM

CT

Third Party Examples

TRDI DVS with integrated IMM

Nortek Aquadopp IM400

SBE 16*plus*-IM V2

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

CTD & Auxiliary Sensors

Underwater Inductive Modem

ADCP or other serial instrument

UIMM

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

Maximum 6000 meters

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