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News for the Ocean Industry

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October/November 2010

SAS Proves its Value in the Miles Between the Shipwrecks



**Subsea Survey IRM 2010 technical program announced
Underwater vehicles take center stage at Galveston event**

**NOAA reopens Gulf of Mexico to fishing
90% of the Gulf open — 23,360 square miles still closed**

**World's largest offshore wind farm operational
UK's Scroby Sands wind farm now powering some 41,000 homes**

**Moratorium on deepwater drilling lifted — outlook still uncertain
Permitting slowdown of shallow water drilling projects has impacted economy**

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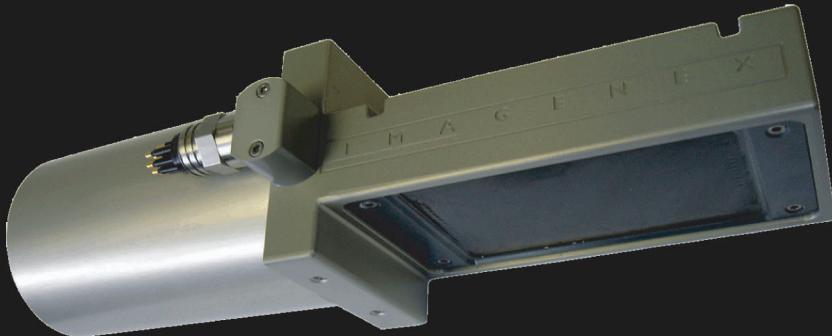
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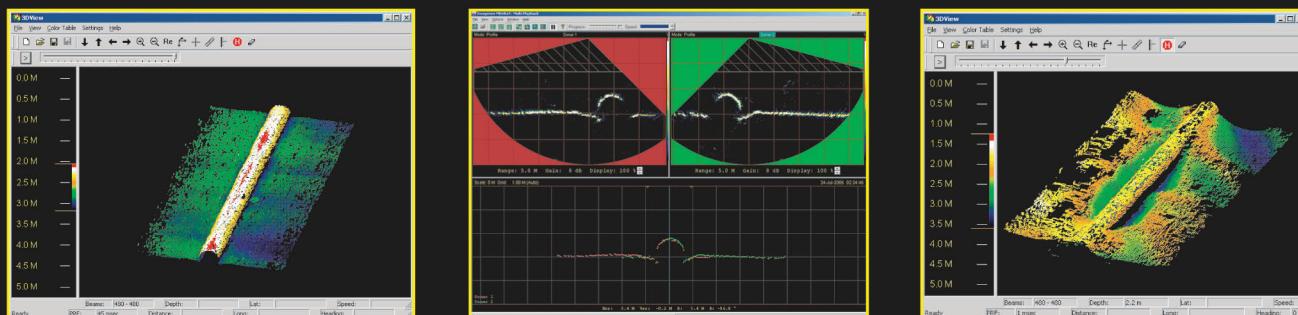
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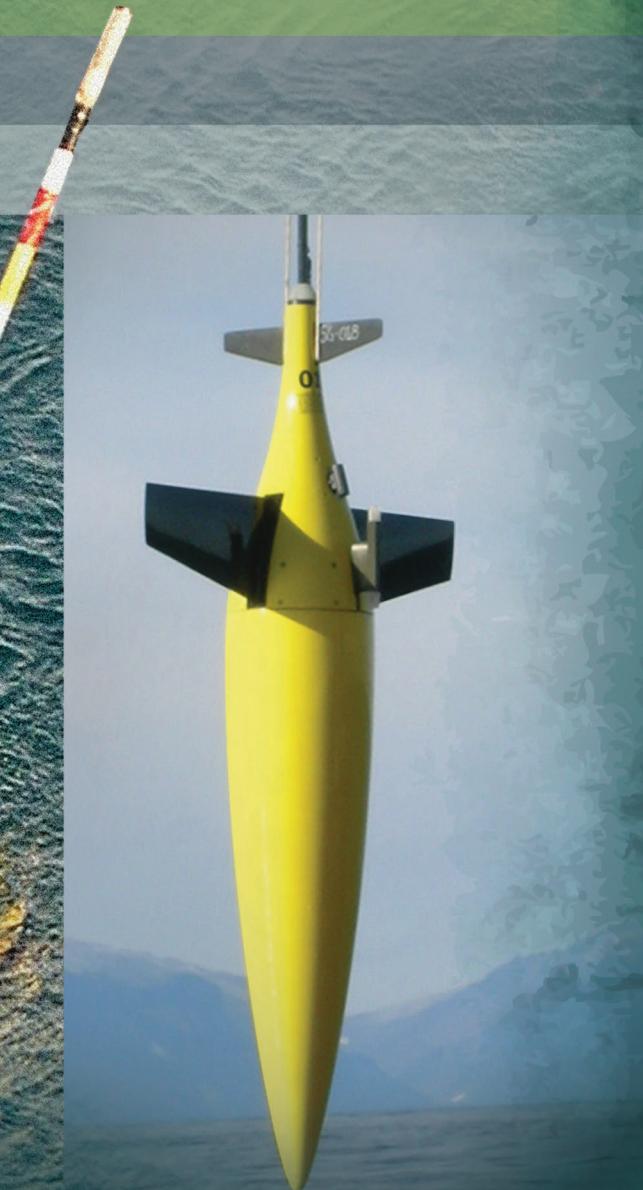
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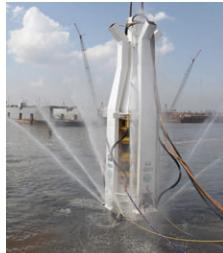
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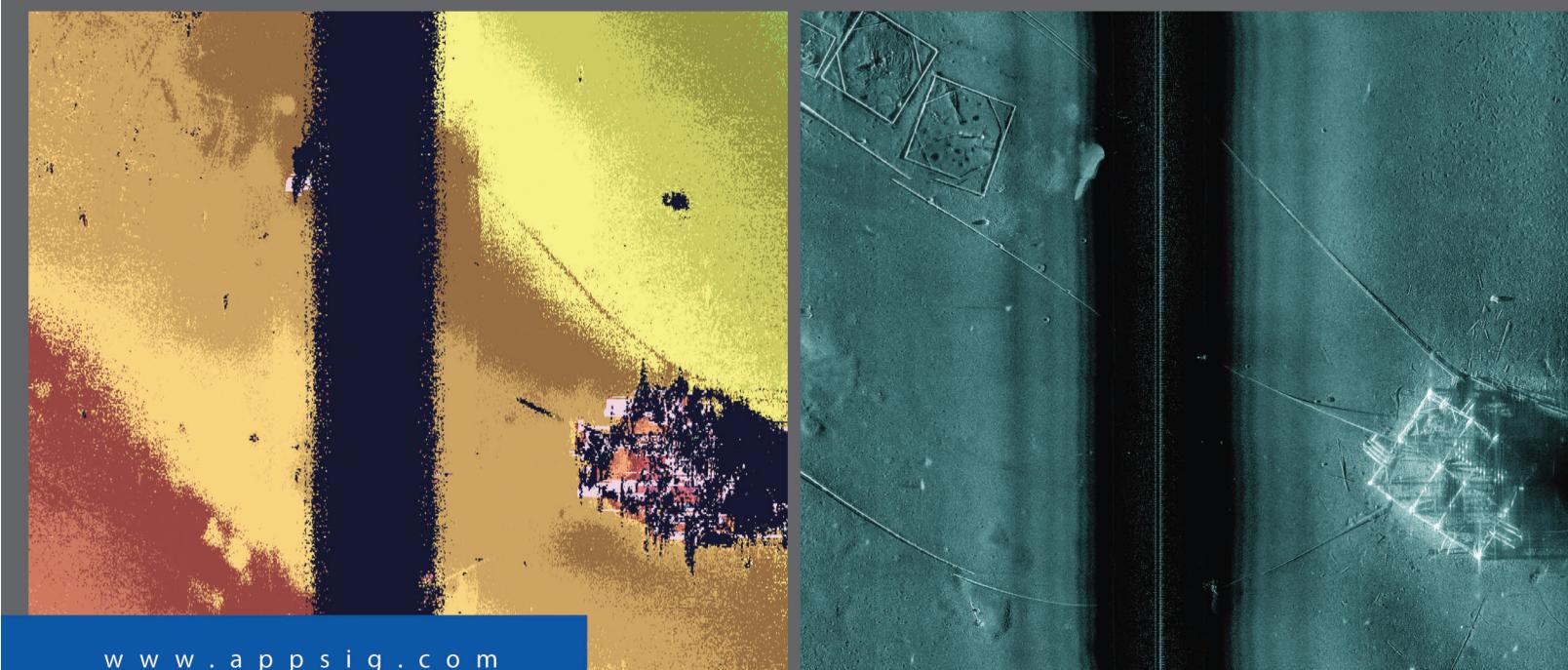
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By Dan White

Ocean News & Technology

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It's the Year 2020 ROV; AUV; or RUV?

As the search for oil and gas leads operators into ultra-deepwater, a new class of underwater vehicle is emerging. We don't know what to call it, but for now we'll call it an RUV (resident underwater vehicle). Experts offer a glance of this new breed at Subsea Survey IRM Conference and Exhibition

Underwater vehicles will take center stage in Galveston this month. TSC's Subsea Survey conference introduces Inspection, Repair and Maintenance (IRM) to this year's event. Vehicle manufacturers are all beginning to introduce IRM versions of their work class ROVs designed to perform tasks in deepwater subsea fields.

But now, AUVs appear to be stepping up to the challenge of performing IRM tasks as well. Combine the two, ROV and AUV and look ahead a decade and you begin to see a new type of vehicle that may live in a subsea field performing work for months at a time. Not a new concept, but one that has yet to be implemented on this scale.

As the offshore oil and gas industry continues to drill and operate at deeper depths, extend tie-back distances, and install more remotely operated infrastructure on the seabed, IRM will become a critical challenge for the operators. Current estimates of worldwide offshore oil and gas infrastructure include 3,000 subsea wellheads, 180,000 kilometers of pipeline, and over 6,000 platforms. The high costs of vessels and their large intervention spreads may give way to new methods for performing IRM work—and a new class of underwater vehicle.

Subsea Survey IRM will host a panel to discuss *The Underwater Vehicle 2020 - a Futuristic Look at IRM Operations in the Ultra-Deepwater Oilfield*. The panel, led by moderator *Drew Michel*, will consist of vehicle and subsea tool manufacturers, along with operators, service companies and technologists who are involved in the planning process for these subsea developments. Invited panelists include representatives from

Oceaneering, Schilling Robotics, Cybernetix, Lockheed Martin, SMD, Perry Slingsby, Subsea 7, Marport Canada, ISE, DOF Subsea and others, plus guest panelist *Graham Hawkes*.

What do we envision?

At first this new breed of vehicle might be deployed autonomously from the surface, diving to great depths, inspecting subsea field and following pipelines from the field to the platform.



But they will need greater power to perform some tasks. So they may be reminiscent of the large workclass vehicle of today but will live on the seabed and plug into power sources provided by the subsea field. They might be cylindrical in shape or

be large open-frame vehicles with powerful hydraulics and manipulators. They may fly throughout the field with or without a tether. They will have state-of-the-art HD vision and lighting, laser scanning optical imaging and high-frequency imaging sonars that will send real-time information via fiber optics built into the subsea field. These so-called RUVs will be capable of depths greater than 10,000 feet, and designed to withstand months of subsea operations without surfacing. They will initiate emergency repairs as well as carry out routine inspection tasks.

The possibilities are endless, although the pre-planning and engineering required to accomplish this dream is no easy feat. But progress is being made at a fast pace with underwater vehicle, tool, software and communications pioneers producing solutions for the future today.

We invite you to come and listen to this panel, ask your own questions and be part of the next generation of underwater vehicle technology (see page 48 for Subsea Survey IRM details).

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Sigourney Weaver Narrates Google Earth Animation on Brazil's Belo Monte Dam

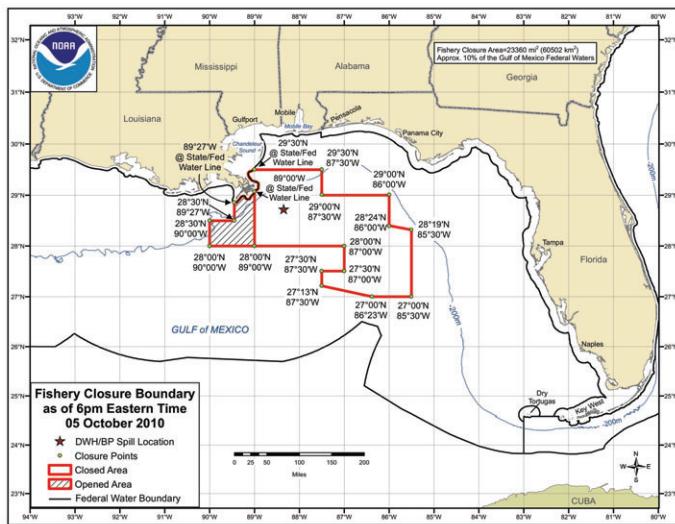
Amazon Watch and International Rivers have teamed up to create a state-of-the-art 10-minute Google Earth 3-D tour and video narrated by actress Sigourney Weaver, with technical assistance from Google Earth Outreach, in support of Brazil's Movimento Xingu Vivo Para Sempre (Xingu River Forever Alive Movement). The video and tour allow viewers to learn about the harmful impacts of and alternatives to the massive Belo Monte Dam Complex on the Amazon's Xingu River. A Portuguese version of the video and tour, narrated by well-known Brazilian actor Dira Paes. Watch the video and download the tour at <http://amazonwatch.org/tour-belo-monte.php>

Hungary opened a criminal investigation yesterday into an escape of deadly toxic sludge from an industrial plant, amid fears that it could grow into a regional environmental disaster. Four people were killed, about 120 were injured, and three are still missing after a dam holding waste slurry collapsed at an alumina works in the southwest of the country, sending a wave of poisonous red mud racing through nearby villages and into a tributary of the River Danube. Rescue teams are searching for the missing people, cleaning up the caustic grime, and pouring tonnes of gypsum into the River Marcal to try to prevent contamination of the Danube, Europe's second-longest river, which flows from Hungary through Croatia, Serbia, Bulgaria, Romania, Ukraine and Moldova on its way to the Black Sea.

Robert Downey, Jr. and Steve McQueen? Sounds like a dream pair to us, even though the late Hollywood legend hasn't been around for 30 years. But RDJ has figured out a way to pull it off anyway: He'll produce and star in Yucatan, a movie based on an original idea by McQueen. The movie will follow a "renegade deep-sea salvage expert" who is hired to steal a treasure that's been stashed underwater in Mexico. In a weird parallel, the movie itself came from hidden treasure of sorts: an old trunk discovered by McQueen's son. Inside, the Great Escape star had stashed hundreds of pages of notes on the project before his death in 1980.

The 85-foot pregnant blue whale that washed ashore near her fetus during the weekend at Bean Hollow State Beach south of San Francisco had suffered "internal injuries consistent with a ship strike," said Joe Cordaro, a biologist with the National Marine Fisheries Service. A necropsy team discovered signs of hemorrhaging in the skeletal muscle and along the right lateral abdomen, and some fractured vertebrae. That there had been hemorrhaging implies that the whale was alive when it was struck. This brings to three the number of blue whales known to have been hit by vessels off California this year. In August a blue whale washed ashore at San Miguel Island with broken bones and other wounds consistent with a ship strike.

NOAA Reopens More Ocean to GoM Fishing —90% Now Open



On October 5 NOAA reopened to commercial and recreational fishing 2,927 square miles of Gulf waters off eastern Louisiana, directly south and southwest of East Bay. This is the eighth reopening in federal waters since July 22.

This reopening was announced after consultation with the U.S. Food and Drug Administration (FDA) and under a reopening protocol agreed to by NOAA, the FDA, and the Gulf states.

"Today's reopening is great news for fishermen and the seafood industry in Louisiana," said Commerce Secretary Gary Locke. The total area reopened is about 1 percent of federal waters in the Gulf of Mexico and 11 percent of the current closed area, as last modified on October 1. No oil or sheen has been documented in the area since July 31. At its closest point, the area to be reopened is about 40 miles south of the Deepwater Horizon BP wellhead.

NOAA began sampling the area on July 28 and again from August 21 through September 18 for shrimp and finfish, including tuna, mahi mahi and red snapper. Sensory analyses of 81 finfish and 5 shrimp samples and chemical analyses of 93 finfish samples in 10 composites and 21 shrimp samples in 3 composites followed the methodology and procedures in the reopening protocol. Sensory analysis finding no detectable oil or dispersant odors or flavors, and results of chemical analysis for oil-related compounds were well below the levels of concern.

NOAA will continue to take samples for testing from the newly reopened area. The Agency will also continue dockside sampling to test fish caught throughout the Gulf by commercial fishermen.

Fishing closures remain the first line of defense to prevent contaminated seafood from entering the marketplace.

The remaining closed area now covers 23,360 square miles, or about 10 percent of the federal waters in the Gulf. The boundary of the fishery closure has changed 29 times after it was first instituted on May 2, at which time it covered about 3 percent (6,817 square miles) of Gulf waters around the wellhead.

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Ocean Briefs

Globe Award Goes to Williamson & Associates, Inc.

Williamson & Associates, Inc., a geophysical services and ocean engineering firm of Seattle, received the World Trade Center Tacoma 2010 Globe Award for the ongoing contribution it makes through international trade participation. Williamson opened its doors in Seattle in 1983 and has provided geophysical consultations with skilled personnel and state-of-the-art equipment for performing a wide range of underwater services. The company has established a broad-based international clientele and gets contracts to perform ocean mining surveys, wreck searches, and telecommunications cable surveys along with custom design and implementation of large rock drill systems.

In 2010, Williamson has completed the cable route survey for the National Science Foundation and University of Washington RSN underwater observatory off Oregon, located the Australian hospital ship Centaur, which was sunk in World War II off Brisbane, and constructed a deep ocean wireline coring drill for the Indian government. Also, Williamson recently completed the Unity cable route survey from California to Japan, located the WWII wrecks submarine USS Grunion and Australian cruiser HMAS Sydney, and delivered two rock coring drills to Japan.

CSA Opens Office and Offshore Support Base in Houma, LA This new office will support operations in the Gulf of Mexico

CSA International, Inc. (CSA) is pleased to announce that it has opened an office and offshore support base in Houma, Louisiana. The Houma Base will support operations in the Gulf



of Mexico, providing dockage for the CSA oceanographic and environmental survey fleet as well as a comprehensive support facility to store and maintain a wide variety of scientific and oceanographic sampling and survey equipment. CSA has decades of experience providing environmental survey and consulting services in the Gulf of Mexico to both commercial customers and government agencies. "The establishment of the Houma Base allows CSA to respond to the Gulf of Mexico with our full capability, ranging from nearshore and coastal operations to deep ocean deployments," stated Kevin Peterson, CSA's President and CEO. "We have a great team of people in Louisiana as well as a fleet of shallow water and deepwater vessels, which allows us to respond to our customers in a timely and cost effective manner." The CSA Houma Base is located on Thompson Road in Houma, Louisiana, with available dock space for approximately 10 large vessels in addition to space for offices

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For more information, visit www.csaintl.com.

Invasive Mussels in the West

The U.S. Fish and Wildlife Service announced today that nearly \$600,000 will be awarded to nine projects targeting three of the highest priorities from the Quagga-Zebra Mussel Action Plan for Western U.S. Waters (QZAP).

"As quagga and zebra mussels spread to the Western United States, they can have devastating ecological and economic impacts as already seen in the east and central United States. We must address the spread of these invasive aquatic species, which threaten our Nation's natural resources, water delivery systems, hydroelectric facilities, agriculture, and recreational boating and fishing," said Ken Salazar, Secretary of the Interior.

Invasive species are among the primary factors that have led to the decline of native fish and wildlife populations in the United States and one of the most significant natural resource management challenges. A paper published in 2005 in the journal Ecological Economics estimated the cost of invasive species impacts to be approximately \$120 billion each year in the United States. We continue to face enormous economic and environmental consequences as a result of invasive, non-native species spreading in our waterways and on our lands.

Once established, these invasive mussels can clog water intake and delivery pipes and dam intake gates. They adhere to boats, pilings, and most hard and some soft substrates. The mussels negatively impact water delivery systems, fire protection, and irrigation systems and require costly removal maintenance.

The QZAP provides a common sense approach to guide collective efforts of those fighting the westward spread of quagga and zebra mussels.

The Service also has provided support for quagga and zebra mussel efforts through regional projects under the 100th

Meridian Initiative, a cooperative effort between local, state, provincial, regional, and federal agencies to prevent the westward spread of zebra/quagga mussels and other aquatic nuisance species in North America. In addition, the Service, through the Aquatic Nuisance Species Task Force, has funded implementation of State and Interstate Aquatic Nuisance Species Management Plans.

For a full list of the QZAP projects and

for more information on aquatic invasive species, please visit www.fws.gov/fisheries/ans.

NOAA Unveils Special Collection of Civil War Maps and Nautical Charts

In honor of the 150th anniversary of the Civil War in 2011, NOAA has assembled a special historical collection of maps, charts, and documents prepared by the U.S. Coast Survey during the war



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years. The collection, "Charting a More Perfect Union," contains over nearly 400 documents, available free from NOAA's Office of Coast Survey website.

"People are planning now for their visits to Civil War sites next year, and we want to give them an opportunity to visualize the terrain, ports, and coasts as they were from 1861 to 1865," said Meredith Westington, NOAA's chief geographer. "Most people wouldn't think of turning to NOAA for historical Civil War documents, but the agency has an amazing legacy."

Coast Survey's collection includes 394 Civil War-era maps, including nautical charts used for naval campaigns and maps of troop movements and battlefields. Rarely seen publications include Notes on the Coast prepared by Coast Survey to help Union forces plan naval blockades against the Confederacy and the annual report summaries by Superintendent Bache as he detailed the trials and tribulations of producing the maps and charts needed to meet growing military demands.

In the nation's early years, the United States lost more ships to accidents than to war. In 1807, President Thomas Jefferson established the Survey of the Coast to pro-

duce the nautical charts necessary for maritime safety, defense and the establishment of national boundaries. By 1861, Coast Survey was the government's leading scientific agency, charting coastlines and determining land elevations for the nation. Today, the Office of Coast Survey still meets its maritime responsibilities as a part of NOAA, surveying America's coasts and producing the nation's nautical charts.

In his annual report on December 15, 1861, Coast Survey Superintendent Alexander Bache wrote, "it has been judged expedient during the past year to suspend usual foreign distribution" of reports on the progress of maps and charts. Distribution of maps, charts, and sketches almost tripled in the 1861 "due to the demands of the War and Navy Departments." However, because the Coast Survey could not easily ascertain the loyalties of private citizens, private distribution of maps was severely restricted among "applicants who were not well known having been referred to the representative of the congressional district from which the application had been mailed."

The Civil War special collection is accessible at www.nauticalcharts.noaa.gov/history/CivilWar.

UK Company Wins New Cabled Ocean Observatory Contract

Texcel Technology Plc, based in Crayford, Kent has won a £1 million - plus contract, from L3-MariPro located in Santa Barbara, California for the design and manufacture of both hardware and software elements of the Regional Scale Nodes (RSN) cabled ocean observing system.

The RSN system, led by the University of Washington (UW) in Seattle, is a component of the National Science Foundation's (NSF's) Ocean Observatories Initiative (OOI). The system will be a vast network of ocean observing sensors and mobile robots interconnected by nearly 800 km of fiber optic cable on the Juan de Fuca Plate off the Washington and Oregon coasts. With the network providing up to 200 kilowatts of power and up to 240 gigabits per second telecommunications bandwidth, the continuous data flow from these subsea sensors will be integrated by a sophisticated computing network and will be available via the Internet in near real time to researchers, public policy makers, and education and public engagement programs. This transformative infrastructure

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This vision carried with it transformational solutions to some of oceanography's most difficult challenges: how to study natural phenomena on time scales that range from nanoseconds to decades and on spatial scales from microns to kilometers. The vision provided novel alternatives to science investigations based on limited and uncertain life spans of battery-powered instruments and the vagaries of northeast Pacific storms that restrict ship-based expeditions to field seasons of only a few months each year.

Texcel was selected by L-3 MariPro due to its successful track record in the area of high reliability subsea design, manufacturing and telemetry solutions. Texcel will supply the science nodes Low Voltage Power and Control System (LVPS). The LVPS includes a 375 VDC power converter, port controller, and state of health telemetry. The LVPS will include the hardware and control firmware designed and manufactured to stringent operating requirements of the deep sea for 25-year life. In addition, Texcel will be supplying the shore-based Network Management System (NMS) for the overall system solution, including both the wet (sub-sea) and dry (shore) based sub-systems.

For more information, visit www.texel-technology.com.

Olympia, two-war naval veteran fights for survival

The USS Olympia, a one-of-a-kind steel cruiser that returned home to a hero's welcome after a history-changing victory in the Spanish-American War, is a proud veteran fighting what may be its final battle.

Time and tides are conspiring to condemn the weathered old warrior to a fate two wars failed to inflict. Without a major refurbishment to its aging steel skin, the Olympia either will sink at its moorings on the Delaware River, be sold for scrap, or be scuttled for an artificial reef just off Cape May, NJ, about 90 miles south.

The 5,500-ton Olympia's caretakers monitor every inch of its deteriorating lower hull and deck, already covered with hundreds of patches. Independent inspectors have concluded that the ship could decay to a point beyond saving within a few years if nothing is done.

"It's an absolute national disgrace. It's an appalling situation," said naval historian Lawrence Burr, author of a book on Olympia. "She is a national symbol, and



she marks critical points in time both in America's development as a country and the Navy's emergence as a global power."

Olympia, which gets about 90,000 visitors annually, closes to the public Nov. 22 to await its fate. Visitors to the museum pay up to \$12, which includes the chance to board the warship.

Since taking stewardship of the floating museum from a cash-strapped nonprofit in 1996, the Independence Seaport Museum has spent \$5.5 million on repairs, inspections, and maintenance. But it can neither afford the \$10 million to dredge the marina, tow the ship to dry-dock, and restore it to fighting trim nor the \$10 million to establish an endowment to care for it in perpetuity.

"She's an icon," said Jeffrey S. Nilsson, executive director of the Historic Naval Ships Association in Smithfield, VA, "She's worthy of being saved."

Efforts to secure private or public funding have been unsuccessful, a stark reminder of recessionary times. Museum officials are reluctantly mulling whether to scrap the National Historic Landmark, said to be the world's oldest steel warship still afloat, or have the Navy sink it off the coast of Cape May.

The 344-foot-long protected cruiser ideally should have been dry-docked every 20 years for maintenance. Instead it has been quietly wasting away in the Delaware since 1945.

Liquid Robotics wins technology innovation award

Liquid Robotics of Sunnyvale, CA was named by the Wall Street Journal (WSJ) as the winner of its 2010 Technology Innovation Award for Robotics. The company's Wave Glider™, unmanned maritime vehicle (UMV) was highlighted as a significant achievement that 1) breaks with conventional ideas in its field, 2) goes beyond marginal improvements on something that already exists, and 3) will have a wide impact on future technology in its field.

Full coverage of the 2010 awards is in the September 27, 2010 issue of the WSJ and available online.

The patented Wave Glider harvests solar and wave energy to provide persistent presence in the ocean. As a comple-

ment to moorings, vessels, and other tools, the Wave Glider enables more efficient and comprehensive ocean exploration, research, and monitoring.

For more information, visit www.liquidr.com.

Tritech Tools Assist Winning SAUC-E Teams

Tritech International supported several successful AUV teams at the recent Student Autonomous Underwater Challenge Europe (SAUC-E), in La Spezia, Italy.

SAUC-E challenges multi-disciplinary teams of aspiring student engineers to design and build subsea vehicles capable of performing autonomous missions in an underwater environment.

In first place, the University of Girona's (Spain) winning 'Sparus' AUV integrated a Micron DST imaging sonar, Tritech's ultra compact mechanical scanning sonar. The Micron contributed to the team's overall success by providing a reliable and accurate obstacle avoidance sensor for the AUV.



Heriot-Watt University (Scotland) placed second overall and also fitted their vehicle 'Nessie V' with a Micron DST imaging sonar and Gemini 720i real-time imaging multibeam sonar. The third place team, ENSIETA (France), used a Tritech sonar on its 'SAUCISSE' AUV.

Hosted by the NATO Research Centre, SAUC-E '10 was sponsored by the office of Naval Research Global (USA), THALES UK, ACSA Underwater GPS, (France), CSSN (Italian Navy), Defence Science and Technology Laboratory (UK), ECA (France), Subsea Asset Location Technologies (UK) and NURC.

For more information on SAUC-E, visit www.nurc.nato.int/events/sauc10/.

RPS launches new ROV spare parts eCommerce website

ROV Product Services (RPS) announces the launch of their new eCommerce website to supply spare parts to the underwater robotics industry. By simplifying the ordering process and reducing critical lead times, RPS is positioned for rapid response to support the Gulf of Mexico and worldwide ROV operations.

The RPS website (www.rovproduct-services.com) offers a comprehensive list of critical ROV spare parts, including motors, valves, hoses, and PCB's for immediate purchase and delivery. With

RPS headquartered in New Orleans, they can provide ready access to key marine ports, from Mobile to Houston, offering hotshot delivery services. Warehouse stocking and spares inventory management round out RPS' offerings.

"RPS is focused on two key sectors; managers that need to rapidly define a MATerial REQuest and buyers that need to process that MAT REQ efficiently," says Norm Robertson. "A manager can define an online 'wish list', email the URL to the purchasing department, where the buyer can access the URL and buy the equipment. It is as simple as that. Our warehouse staff reacts immediately to shipment notifications, packaging the parts and shipping according to client priority requirements defined during checkout. For the Gulf of Mexico region, a 3-6 hour hotshot delivery service is available. We are truly 'ROV Parts on Demand'."

By identifying a need in the offshore ROV industry, RPS is positioned to support the critical operations of the oil and gas subsea industry.

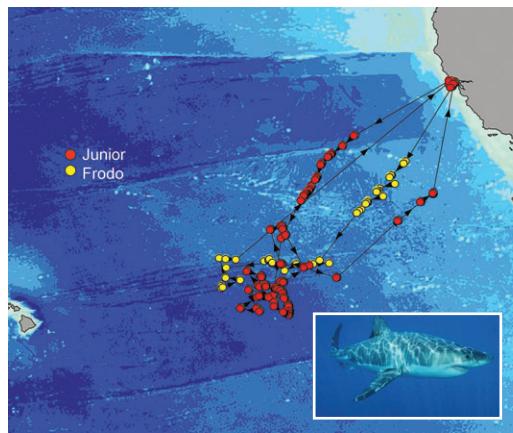
For more information, contact Norm Robertson at (504)214-2906, or norman.robertson@rovproductservices.com.

Tagged white sharks return to the Gulf of the Farallones

In the fall of 2009 two adult male white sharks were tagged by the Marine Conservation Science Institute (MCSI) in NOAA's Gulf of the Farallones National Marine Sanctuary under special permits from the California Department of Fish and Game and the Farallones marine sanctuary. The MCSI was founded by Dr. Michael Domeier, a pioneer in the studies of apex predators and protected species and the Chairman of the International White Shark Symposium held in Hawaii.

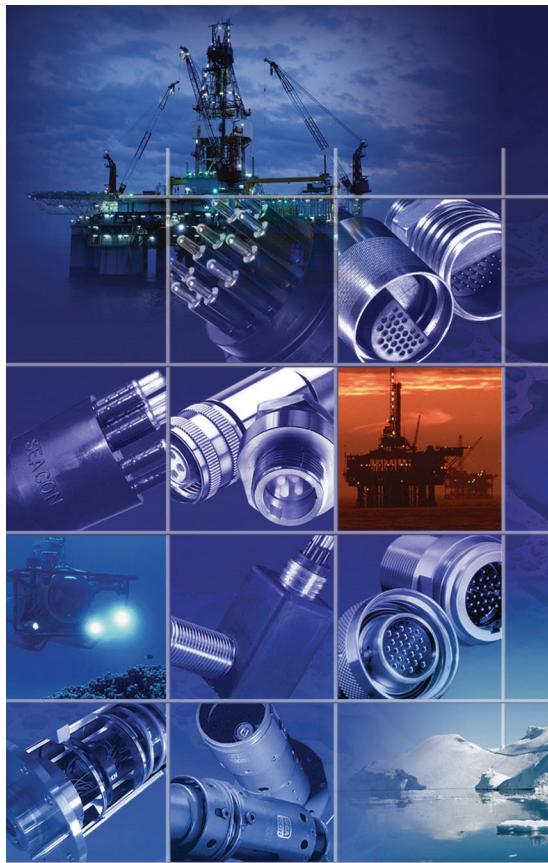
The sharks were tagged with real-time tracking devices called SPOT tags, which can track the sharks for up to 6 years.

Both sharks returned to central California in late July and early August after completing their normal migration and seasonal residency in the Shared Offshore Foraging Area (SOFA). Upon return to California, each shark visited the outer waters of Drake's Bay. Junior was recently detected in the area where he was originally tagged. Junior was offshore 225 days and traveled 4,000 miles, while Frodo was offshore for 269 days covering 3,000 miles.



Mature female white sharks typically visit the Gulf of the Farallones in alternate years, suggesting they have a multi-year migration pattern likely tied to a two-year cycle of reproduction. Where females mate and give birth is unknown, but this tagging method could help answer these questions and perhaps identify where remote regions where these sharks could be particularly vulnerable to commercial fishing activity.

For more information, contact Michael Domeier at ml.domeier@gmail.com.



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EXHIBITING AT SUBSEA SURVEY 2010
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EXHIBITING AT SUBSEA TIEBACK 2011

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A month after a positive legal ruling allowing the developers of America's first offshore wind farm to begin construction, Interior Secretary Ken Salazar signed a 28-year lease of federal waters to Cape Wind. The lease was signed at an American Wind Energy Association conference on offshore wind in Atlantic City, New Jersey. Salazar had already given his approval to the planned 420-MW offshore wind project in April. The signing of the lease makes the deal official. The lease is for 25 square miles in Nantucket Sound off the coast of Massachusetts. Cape Wind will pay around \$88,000 each year for access to the federal waters. There will also be an operation fee of up to 7% based upon how much energy the project produces.

Energy Secretary Steven Chu has announced selections for more than \$37 million in funding to accelerate the technological and commercial readiness of emerging marine and hydrokinetic (MHK) technologies, which seek to generate renewable electricity from the nation's oceans and free-flowing rivers and streams. The 27 projects range from concept studies and component design research to prototype development and in-water device testing. This unprecedented level of funding will advance the ability of marine and hydrokinetic energy technologies to contribute to the nation's electricity supply, DOE reported.

The U.S. Department of Energy's National Renewable Energy Laboratory (NREL) announces the release of a new report that assesses the electricity generating potential of offshore wind resources in the United States. According to the ***Assessment of Offshore Wind Energy Resources for the United States***, 4,150 gigawatts of potential wind turbine nameplate capacity (maximum turbine capacity) from offshore wind resources are available in the United States. The estimate does not describe actual planned offshore wind development, and the report does not consider that some offshore areas may be excluded from energy development on the basis of environmental, human use, or technical considerations. According to the U.S. Energy Information Administration, in 2008 the nation's total electric generating capacity from all sources was 1,010 gigawatts or about 25% of the potential offshore wind resources.

The first offshore wind energy turbine in the United States will be installed off the Texas coast near Galveston Island in late 2010. The 2.75 MW turbine is a precursor to the 300 MW Galveston Wind Project and 3500 MW of areas already leased for Texas offshore wind operations.

The South West Regional Agency's Wave Hub marine energy project has been installed on the seabed after lowering the 12-ton hub into 55 meters of water, 16 kilometers offshore. Wave Hub is the world's largest test site for wave power devices located off Cornwall, England.

World's Largest Offshore Wind Farm Operational



The UK's largest offshore wind farm at Scroby Sands, off Caister, Norfolk, is now officially generating power for as many as 41,000 homes. The occasion marks the culmination of more than a decade of planning and development and reinforces the UK's increasing commitment to commercial-scale renewable energy projects.

Patricia Hewitt, Secretary of State for Trade and Industry said, "Connecting Scroby Sands to the grid establishes the UK as the world's second-biggest generator of offshore wind power. Our plans for further offshore wind farms around the UK represent the world's biggest-ever expansion of renewable energy, plans that are good for the environment, good for Britain's energy needs, and good for the economy."

The GBP 75 million (US\$ 140 million), 60-MW project was developed and is owned and operated by E.ON UK and uses 30, 2-MW wind turbines from Danish wind turbine company Vestas. The site is located on a sand bank known as the Middle Scroby Sands, which lies approximately 3 km east of the Great Yarmouth Borough coastline in the county of Norfolk.

E.ON UK and Vestas were also involved in the first offshore two turbine pilot project at Blyth Offshore, Northumberland, which helped provide the skills and experience to build Scroby Sands. The Blyth and Scroby projects were supported by European Commission Thermie funding. Timetable consent was granted in April 2002, and E.ON UK started offshore construction in Autumn 2003.

The Scroby Sands wind project is, by far, the most advanced UK utility-scale offshore wind farm, and, through feedback of information via a European Union contract, will provide valuable information to other developers planning more ambitious projects further offshore.

Most of the areas of seabed to be allocated by Crown Estate are likely to be further offshore than the Scroby Sands wind farm - possibly averaging 5 km as opposed to Scroby's 3 km offshore. As such, the wind turbines at Scroby will be more visible from the shore for a higher percentage of the year than those of future projects. This reflects the fact that the Scroby project is an appropriate "next step" after Blyth and will not be typical (in terms of distance from shore) of the majority of future UK offshore wind farms.

E.ON UK is one of the largest renewable generators in the UK. The company has stakes in 20 wind farms across the country, is co-firing biomass alongside coal at two of its power stations, and owns the largest hydro power station in England and Wales. The company already has plans for using the experience gained from the construction and early operation of the Scroby Sands wind farm to harness wind energy from more harsh offshore environments in less sheltered waters around the UK.

New Jersey Enacts Law to Boost Offshore Wind Industry

In a bid to boost offshore wind energy, New Jersey enacted a law on August 19 that provides a financial incentive for companies to construct turbines in the Atlantic Ocean off the state's coast. The "Offshore Wind Economic Development Act" will offer offshore wind renewable energy certificates to approved projects for the generation of 1,110 megawatts of power. The new law also seeks to attract firms that build wind turbines, their components, or water access facilities by granting up to \$100 million in tax credits as well as financial assistance to qualified applicants. The Garden State used a similar approach to encourage photovoltaic installations and is now producing 57.3 megawatts DC, putting it second behind only the much-sunnier California on the list of states.

Under provisions of the new law, the New Jersey Board of Public Utilities will determine a process for utilities to buy offshore renewable energy certificates from commercial offshore wind farms. State statutes require New Jersey get 22.5% of its electricity from renewables by 2021.

Utility Builds Own Ships for Offshore Wind Farm Development

After successful completion of the detailed planning, construction has begun of RWE's first own offshore installation ship with today's steel cutting ceremony at the Korean shipyard of Daewoo Shipbuilding & Marine Engineering Co. Ltd. The first steel sections of the 100 meter long and 40 meter wide ship were cut to size under the eyes of Paul Coffey, CCO of RWE Innogy. On completion next year, it will be the first of its kind that can transport up to four offshore wind turbines of the multi-megawatt class at the same time and erect them in water depths of more than 40 meters. The installation ship is intended for the construction of the German offshore wind farm Nordsee Ost.

"The steel cutting ceremony today represents a huge step forward for RWE and our plans to construct some of the largest offshore wind parks in the world," said Paul Coffey during the steel cutting ceremony.

RWE Innogy had already placed the order for construction of two identical offshore installation ships with the Korean shipyard at the end of last year. The contract value for each of these so-called "Jack-up Platforms" is around EUR 100 million. Completion of the first platform is planned for the autumn of 2011. From then on, the installation ship will be operated from its home port of Bremerhaven in the

construction of the "Nordsee Ost" wind farm and begin placing the first foundations in the German Bight. The installation ship will set sail with two jacket foundations every week. Later, it will take over the transport and installation of a total of 48 wind turbines of the 6-megawatt class. Full completion of the Nordsee Ost wind farm is planned for 2013. From then on, the wind power plant with installed power of 295 megawatts will supply the equivalent

of 295,000 homes in Germany with electricity every year.

Besides the Nordsee Ost wind farm, RWE Innogy is developing the offshore wind farm Innogy Nordsee 1 in German territorial waters. At around 960-MW of installed power, this will be the biggest offshore wind farm planned off the German coast. It will be built in an area of 150 square kilometers about 40 kilometers north of the North Sea island of Juist.

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Off the north coast of Wales, RWE Innogy is already operating the offshore wind farms North Hoyle (60-MW) and Rhyl Flats (90-MW). The decision was recently taken to build a third wind power plant off the coast of Wales, Gwynt y Mor (576-MW). The second, identical installation ship will be used to build that farm. In addition, the company presently has a 50 percent stake in the construction of the 504-MW wind farm Greater Gabbard off the southeast coast of England. Alone or with partners, RWE Innogy is presently developing further major projects in the UK, such as Triton Knoll (1,200-MW), Atlantic Array (1,500-MW), Galloper (500-MW), and Dogger Bank (around 9,000-MW). In Belgium, the company is also involved in the Thornton Bank wind farm, which in its first stage (30-MW), is already in commercial operation, and is also developing the offshore wind project Tromp Binnen (300-MW) in the Netherlands.

Tidal power conference

The Tidal Energy Demonstration and Evaluation Center (TEDEC) based at

Maine Maritime Academy (MMA) will sponsor a conference on tidal hydropower on Saturday, November 13, 2010, on the college campus in Castine. The event, entitled Progress and Challenges of Small-Scale Tidal Power, will take the form of a day-long academic forum for the exchange of information about ideas, developments, and initiatives surrounding alternative energy and tidal power. According to organizers, participants will have the opportunity to network with regulators, scientists, and exploratory permit holders. Members of the public who are interested in discussions surrounding tidal power are encouraged to attend this upcoming forum.

Ann Miles, director of the division of hydropower licensing, Office of Energy Projects, Federal Energy Regulatory Commission (FERC), will provide the keynote address at the event luncheon. Panelists and presenters scheduled to participate in the event include representatives from Ocean Renewable Power Company (ORPC), Maine Department of Environmental Protection, Army Corps of Engineers, and Maine Technology Institute. Academic presentations on tech-

nology considerations for tidal devices will be made by Dr Richard Kimball, associate professor of engineering at Maine Maritime Academy, and Dr. Michael "Mick" Peterson, Jr., professor of mechanical engineering at the University of Maine.

The TEDEC based at MMA is the only in-stream tidal energy device testing facility in the United States. Earlier this year, the Center received a special order of clarification from the FERC, enabling it to further the research and testing of field-scale models of tidal energy devices at two sites located near the Castine college.

The Progress and Challenges of Small-Scale Tidal Power Forum will be held from 9:30 a.m. to 4 p.m. on Saturday, November 13, and will include a morning coffee hour, a luncheon with keynote speaker, and a post-event networking reception. The Forum is open to the public, and seating is limited. Participation is by pre-registration only and will cost \$25 per person. Students are invited to participate for free with pre-registration. For more information, contact Rick Armstrong at TEDEC@mma.edu or 207-326-2186.

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The contiguous United States had its 14th warmest September on record, according to the latest NOAA State of the Climate report issued today. Average temperatures for September were 67.1 °F, which is 1.7 °F above the 1901-2000 average. Average precipitation in September was 2.69 inches, 0.21 inches above the 1901-2000 average. This monthly analysis, based on records dating back to 1895, is prepared by scientists at NOAA's National Climatic Data Center in Asheville, NC, and is part of the suite of climate services NOAA provides.

Up to 3,000 sharks will be caught and released on the Great Barrier Reef to estimate whether the predators are in danger of being overfished. Scientists from James Cook University will carry out the three-year project, the largest of its kind carried out in 20 years, to determine how to balance shark fishing with supporting stocks in northern waters.

Scientists studying coral reefs in the Gulf of Oman have issued the warning after being shocked by the impact of one large-scale bloom, which destroyed a coral reef in just three weeks. Around 95% of the hard coral beneath the algae died off and 70% fewer fishes were observed in the area.

Scientists from the MARUM Center for Marine Environmental Sciences and the Max Planck Institute for Marine Microbiology in Bremen on board the German research vessel Meteor have discovered a new hydrothermal vent 500 kilometers south-west of the Azores. The vent with chimneys as high as one meter and fluids with temperatures up to 300 °C was found at one thousand metres water depth in the middle of the Atlantic Ocean. The discovery of the new deep-sea vent is remarkable because the area in which it was found has been intensively studied during previous research cruises.

As oil from the Deepwater Horizon disaster oozed close to the beaches of Florida and Alabama, state and federal officials launched a desperate effort to save a generation of sea turtles. The plan: Dig up thousands of turtle eggs and move them to Kennedy Space Center, so they would hatch in an oil-free environment. Of the more than 25,000 eggs that were relocated, 14,676 successfully hatched and were released into the Atlantic Ocean, he said. That means more than half of them hatched — in fact, nearly six out of 10 made it into oil-free water.

Deep Ocean Coral Reefs Found in Mediterranean



The exploration vessel Nautilus, with a team of experts of the University of Haifa's Leon H. Charney School of Marine Sciences, headed by Prof. Zvi Ben Avraham, discovered for the first time an area of reefs with deep-sea corals in the Mediterranean offshore Israel. This area apparently stretches over a few kilometers, 700 meters under the surface and some 30 to 40 km off the coast of Tel Aviv. According to the researchers, this southeastern region of the Mediterranean has only sparse sea life and, therefore, the discovery is in fact parallel to discovering an oasis in the middle of an arid expanse.

"We did not expect, know, or even imagine that we would come across these reefs and certainly not such large ones. It's like finding a flourishing oasis in the middle of the desert," said Dr. Yizhaq Makovsky, who directed the University of Haifa control center for the project. After two and a half weeks at sea, during which time the ship's robots plunged as far as 1.7 km down into the depths of the Mediterranean, the Nautilus returned to land and the collaborative research team have begun to examine the many discoveries that they made.

Probably the most significant — and most surprising — of these discoveries were the reefs of deep-sea coral, the first deep-sea coral reefs to be found offshore Israel. Their discovery has broad scientific importance. For example, they can help us in understanding the mechanisms of their survival in the environmental conditions of the deep sea as well as unfold the history of these conditions with the effect of global changes.

"This cruise has provided a nutshell sampling of this maritime region, but our discovery only demonstrates the potential of the many surprises that await us in the depths of this area. An immediate implication of this discovery is that there is an urgent need to classify the area as a deep-sea reserve, as are other coral reef areas around the world," explained Dr. Makovsky.

In-depth research on the sea-bed samples are yet to get well under way, but additional discoveries that can already be reported from the Nautilus expedition are two shipwrecks — probably modern boats that sunk over the past few decades and fish and crabs that were photographed in their natural habitat for the first time, hundreds of meters beneath the Mediterranean surface.

One of the fascinating fish that were captured by the Nautilus's cameras was the *Chimaera monstrosa*, of the "ghost sharks" family that branched off from sharks some 400 million years ago.

The expedition also discovered and documented a 10 cm crab hiding in the recess of a rock, making it difficult for the research team to identify it. As with all the other discoveries, this crab was also documented thanks to the technological capabilities provided on the Nautilus. (ScienceDaily Oct. 7, 2010)

Coastline Surveys Ltd. support benthic solutions in Environmental baseline studies in Greenland

Coastline Surveys Limited recently supported Benthic Solutions Limited working offshore Greenland carrying out a series of environmental baseline site surveys on behalf of Cairn Energy, a UK-based company that drilled a number of exploration wells off the west coast of Greenland this year.

The waters off the west coast of Greenland are said to have significant potential resources of oil and gas and Greenland's future economy could lie in hydrocarbons rather than the traditional industries such as fishing. Cairn Energy is one of the first companies to drill exploration wells in the Baffin basin off Disko Island to the west of the country and extensive environmental baseline studies were undertaken before the drilling started.

Coastline Surveys provided seabed sampling equipment and specialized technical personnel to support Benthic Solutions in acquiring all the data needed for the study. The survey work was conducted in freezing temperatures from the



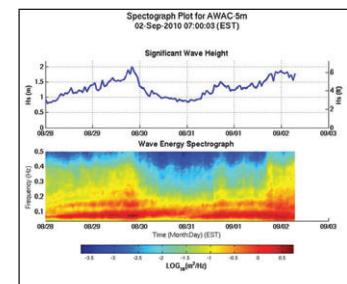
Nordica vessel in April and May of this year. The scope of work and survey itself was designed, developed and managed by Benthic Solutions in order to ensure the survey provided detailed information on the seabed environment as well as to meet the needs of the Greenland mineral and petroleum regulatory authorities.

Coastline's Managing Director David Hitchcock says that "Working in places like Greenland reflects the company's exciting growth into new markets and new regions."

For further information, visit www.coastlinesurveys.co.uk.

Real-time Wave Data from Hurricane Earl

NortekUSA visited with engineers at the U.S. Army Corps of Engineers Field Research Facility in Duck, NC late July, as engineers were busy preparing the Aquadopp Profilers shown here for



nearshore deployment. These two instruments were to become the latest addition to the Duck Cross-shore array, which already included four Nortek Acoustic Waves and Currents (AWAC) sensors and two Waveriderbuoys. The Aquadopps were deployed at depths of 2 m and 3 m.

This amazing data set is used in the development of the very latest generation cross-shore wave models and we invite

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As we approach the peak of hurricane season, sensors are cabled to the shore and hourly data are available on the Field Research Facility Website at www.frf.usace.army.mil/frfzoom.shtml. Simply clicking on any of the stations will instantly produce an array of data products, including wave heights, current profiles, and energy spectrographs.

Most of the plots are created using the Wavevector Software product.

BOEM Awards Contract for Mid-Atlantic Study to CSA International

Each year, BOEM funds about \$30 million for environmental studies off the Atlantic and Pacific Coasts, Alaska, and the Gulf of Mexico. Information gained from these studies contributes significantly to knowledge about our oceans and informs U.S. policy decisions regarding offshore energy development.

"We will continue to seek out opportunities to work with our federal partners to enhance knowledge of our oceans and

advance the work within the scientific community," said BOEM Director Michael R. Bromwich.

The study, slated to begin in early 2011, will be sponsored by the National Oceanographic Partnership Program and is a collaborative effort between BOEM, the National Oceanic and Atmospheric Administration (NOAA) Office of Ocean Exploration and Research (OER), and the U.S. Geological Survey (USGS). NOAA OER will provide two research vessels and a remotely operated vehicle, and USGS scientists will be working alongside researchers from CSA International, Inc.

The study will explore and examine selected habitats that will refine and extend the understanding of the distribution and complexity of hard bottom communities in the mid-Atlantic area. One objective of the study will be to determine environmental conditions that influence distribution of sensitive communities, especially regarding communities that are sensitive to oil and natural gas development.

The exploration and research effort will also be directed toward archaeological

artifacts such as shipwrecks. Surveys and site-specific studies will be conducted to obtain necessary information for the avoidance of such artifacts if energy development operations were to one day be permitted in the area.

Gulf of the Farallones Marine Sanctuary Asks Bay Area Boaters to Watch Out for Whales

NOAA's Gulf of the Farallones National Marine Sanctuary advises San Francisco Bay Area boaters to watch out for and steer clear of whales, which are found in the Gulf of the Farallones, either to migrate or to feed.. Several whale species — grays, humpbacks and blue whales — are the most common in this area.

Unlike blue whales, which mainly stay farther offshore, humpbacks and gray whales are at a particularly high risk of collisions with vessels, as they often travel near shore and may even wander into the Bay itself. San Francisco Bay and Tomales Bay always have a few springtime and summer whale residents.

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Neptune Canada wires subsea volcanic region

Starting September 12, NEPTUNE Canada began installing the fifth and most challenging portion of its cabled ocean observatory — 2.3 km below the ocean surface at Endeavour Ridge. The NEPTUNE Canada team departs from Esquimalt on a month-long journey 300 km offshore, after loading the University of Washington's research vessel T.G. Thompson with instrumentation, cables, and specialized installation equipment, including the remotely operated vehicle, ROPOS.

Installation of cable and instruments at the Endeavour Ridge node site 300 km off the BC coast will give scientists an unblinking look at how the region — renowned for its volcanic activity — fits into and influences marine, climate, and tectonic systems off Canada's west coast.

Endeavour Ridge will be NEPTUNE Canada's most challenging installation yet. During the month at sea, the team will lay three sets of 6 km long power and fiber optic cables between the node (installed in September 2009) and the scientific study sites. To do this across a subsea mountain range 2.3 km below the ocean surface, they need to avoid deep fissures, sharp glass-like rocks, and hot vents spewing plumes of corrosive minerals and gases at temperatures exceeding 300 °C.

To start, 18 instruments will be installed at the site, including seismometers to measure tectonic processes, cameras, and moored instrument buoys to document the ocean currents and chemical fluxes. Scientists will also observe the unique deep-sea "black smoker" ecosystems that flourish in the main hydrothermal vent field.

On the way to Endeavour, two major science platforms will be installed at the Barkley Canyon node site on the continental

slope. A two-tonne vertical profiler system — the first of its kind in the world — will measure nutrients and warmth from the seafloor 400 metres up to the surface. Wally II, the second generation of the world's first Internet-operated deep-sea crawler, will measure processes of seafloor methane hydrates.

Endeavour presents many technical challenges. A 13-tonne node, which provides power and communications, was installed in September 2009. It's in a location twice the distance from the ridge than originally planned due to the lack of a large enough landing area. As a result, a complete cable redesign was required.

Once at Endeavour, seafloor surveys will be conducted to determine the best route for three 6 km cable extensions that will connect the node to the vent study areas. These cables need to be laid with great care to avoid crevasses, sharp rocks and hot vents. Protective mats will be placed under the cables in areas where glass-like rock is present. Once the cables are successfully laid, the ROPOS submersible will initially connect 18 instruments, with more to come in future years.

The expedition is led by Dr. Mairi Best, NEPTUNE Canada's associate director (science), and Lucie Pautet, NEPTUNE Canada's associate director (engineering). Live video, twitter feeds, and blogs will all be streaming from the ship. Join scientists in virtual participation with the cruise (neptunecanada.ca).

For more information on NEPTUNE Canada, visit www.nep tunecanada.ca.



*Wally II the underwater crawler.
(courtesy Neptune Canada)*

A photograph of a dolphin leaping out of the water, its body arched as it moves through the air. Water droplets are visible around its pectoral fins and tail. In the background, other dolphins are visible in the ocean.

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Mustang awarded Jack, St. Malo contract

Chevron awarded Mustang a contract to carry out designs for the Chevron Jack and St. Malo deepwater facility in the 7,000 feet of water in the Walker Ridge area of the Gulf of Mexico. The design work is to be carried out for the topsides of the floating semi-submersible facility. Mustang is also required to provide detailed engineering for integrated control and safety systems under its international master agreement with Chevron. The Jack and St. Malo facility is Chevron's second semi-submersible in the U.S. Gulf and one of the largest in the world.

Hess takes bigger stake in Tubular Bells

Hess Corp. agreed to acquire an additional 20% interest in the Tubular Bells oil and gas field in the Gulf of Mexico from BP for \$40 million and will become the operator. The increased ownership will bring Hess' working interest in Tubular Bells to 40%. Chevron holds a 30% interest, and BP will retain 30%. The deal is conditioned upon regulatory approval. Tubular Bells, which was discovered in 2003, is a deepwater field about 135 miles southeast of New Orleans, Louisiana.

Exxon plans to sell some U.S. Gulf assets

ExxonMobil Corp. is planning a small sale of oil and gas production assets in the Gulf of Mexico, primarily shallow water installations, the U.S. oil company said. The sale, in its initial stages, includes pipeline assets and unmanned platforms along the central Gulf Coast that produce 12,000 barrels of oil per day and 49 million cubic feet of natural gas per day, a company spokesman said. "The company markets assets that for a variety of reasons may be of more value to others," Exxon said in a statement. The production represents less than 15% of Exxon's total output from the Gulf. Last year, Exxon reported average net production of about 85,000 barrels of liquids per day and 350 million cubic feet of gas per day from the Gulf of Mexico.

Decommissioning carries big pricetag

The cost of decommissioning offshore oil and gas platforms on the UK continental shelf could exceed \$30 billion over the next 30 years, according to new research findings. A report released by Deloitte and Douglas-Westwood reveals that the majority of decommissioning activity and related spending will occur between 2017 and 2027. The study estimates that 260 offshore oil and gas platforms will be decommissioned over the next 30 years. The study forecasts that the anticipated level of decommissioning will provide a major business opportunity for the oil services industry, especially vessel operators and well service companies, and could be a significant boost to regional economies. Meanwhile, the International Energy Agency predicts that UK oil output will shrink by 50,000 barrels per day to 1.42 million barrels per day this year, and by 100,000 barrels per day to 1.32 million next year.

Chevron and Turkey to explore the Black Sea

A Chevron subsidiary has signed an agreement with Turkey's state oil company, Türkiye Petrolleri Anonim Ortaklığı (TPAO), to explore the Black Sea. Under the joint operation agreement, Chevron will buy a 50% interest in a western portion of licence 3921, an 8,700 square mile block in northwest Ankara. TPAO will hold the remaining 50% and will be the operator of the initial exploratory well, which is currently being drilled. Based on the success of the initial well a 3D seismic will be required and an additional exploratory well will be drilled.

Permit Slowdown to Hurt Economy

A report released in early October by the Maguire Energy Institute at the SMU Cox School of Business revealed that a marked slowdown in the issuance of permits to drill new shallow-water wells in the Gulf of Mexico packs serious implications for the Gulf states' economy.

The report found that the Department of Interior's slowdown in issuing permits for new shallow-water drilling operations — despite lifting the moratorium on this segment of the industry in May — has placed 40,000 Gulf region jobs in jeopardy, with "very serious economic implications for the region that rival, or exceed, those of the spill and moratorium."

"Studies have found that over the course of one year, should 75% of the rigs become stacked as a result of (government) inaction on issuing permits, the direct economic losses to the nation's businesses and workers would exceed \$4.3 billion, with Louisiana taking the biggest hit and Mississippi second," wrote the report's author, Maguire Energy Institute associate director Dr. Bernard L. (Bud) Weinstein. "Adding in the ripple effects of lower indirect and induced spending, the nation's income losses could exceed \$12.5 billion."

He said in the report that despite the industry's demonstrated safety record and straightforward approach to sub-surface energy resource extraction, as of September 22, the federal government had issued only six permits for new shallow-water wells in the five months since the April 20 Deepwater Horizon accident.

"Prior to the spill, the Interior Department issued an average of 10 to 15 permits for new shallow-water wells per month," Weinstein said. "The vast majority of companies working in shallow water are small, independent operators, making the interruption of new shallow-water drilling especially harmful to both them and the small businesses along the Gulf Coast that support them."

Meanwhile, companies that drill in shallow waters of the Gulf said in mid-September they were at an "impasse" with the Interior Department over permitting policies they alleged were bringing industry to a standstill. The Shallow Water Energy Security Coalition met in Louisiana with Michael Bromwich, who directs Interior's Bureau of Ocean Energy Management, but the meeting failed to produce reassurances about speeding up permits the group was seeking.

"With 15 of the total of 46 available shallow water rigs now idle without permits and only five permits for new wells issued since April, we are clearly at an impasse with the regulators. While we share Director Bromwich's commitment to safety, BOEM must recognize that it cannot continue to shove a square peg into a round hole by treating all offshore drilling operations the same, disregarding history and geological facts," said Jim Noe, the group's executive director who is also a top executive with Houston-based Hercules Offshore, Inc.

Other companies in the coalition include Apache Corp., Phoenix Exploration, Rowan Companies, and other energy and drilling services companies.

Shell plans second deepwater production hub in GoM Mars field

Shell Oil Co. has made a final investment decision for its Mars B deepwater development, located about 130 miles south of New Orleans, Louisiana in the Gulf of Mexico. The development will include a second tension leg platform (TLP), named Olympus, to enhance recovery from the prolific Mars field.

The new platform will also provide process infrastructure for two of Shell's recent deepwater discoveries, West Boreas and South Deimos, and can potentially serve the nearby, rich exploration portfolio in the Gulf of Mexico.



Olympus tension leg platform

The tension leg platform is a proven concept, which Shell first successfully executed in the early 1990s for its Auger hub. Shell then followed with deepwater, tension leg platforms for its Mars A, Ram-Powell, Ursa, and Brutus developments. First production from the Mars B Olympus platform is expected in 2015. The facility will be designed to process roughly 100,000 barrels of oil equivalent per day.

Shell discovered the deepwater Mars field in 1989. Production from the field was first brought online in 1996 and has contributed to the Gulf of Mexico's position as a critical component of the U.S. energy supply. The investment decision to design, construct, and install the Olympus platform extends the production life of the Mars field, for decades to come, and increases the oil and gas recovery from this strategic offshore asset.

"This significant investment decision demonstrates Shell's continued commitment to responsibly maximize deepwater oil and gas recovery and make a positive impact on this country's domestic energy supply," said Marvin Odum, Upstream Americas director and president of Shell Oil Co.



Technical rendering of the West Boreas subsea tieback to the Olympus tension leg platform

"Responsible offshore operations remain our priority," he added. "It's imperative that this industry protects the millions of people it employs, its operating environment, and the critical energy resource. Shell's Olympus platform will build on our more than 15 years of safe offshore development and deepwater expertise."

Shell will operate the Mars B Olympus tension leg platform and currently holds a 71.5% working interest in the development. BP holds the remaining 28.5% working interest. In the Gulf of Mexico, the Mars B development will draw production from eight Mississippi Canyon blocks: 762, 763, 764, 805, 806, 807, 850, and 851.

The tension leg platform, tentatively called Mars B, would be a sister platform to the massive Mars platform that's been in place since 1996. It will have the ability to produce up to 100,000 barrels of oil a day.

No price tag was given for the project, but the first Mars cost about \$1.6 billion when it was installed. Shell owns a 71.5% stake in Mars B and will operate the platform. BP also owns an interest in the project.

Shell reorganized its North American operations in the past year in a bid to reduce \$1 billion in costs. The unit, known as Upstream Americas, is now organized into four groups: heavy oil, onshore gas, deepwater and exploration. The \$40 billion investment will be spread among the groups.

Shell has about 40 trillion cubic feet of tight gas reserves under its control, with plans to double production from 2009 to 2015 to more than 400,000 barrels of oil equivalent per day. In the Gulf of Mexico, drilling activities in 2009 and 2010 added over 500 million barrels of oil equivalent for Shell, including the 2010 Appomattox discovery, which has total resources in excess of 250 million barrels.

Shell drilled the Appomattox discovery well on Mississippi Canyon Block 392 to a depth of 25,077 feet and encountered about 530 feet of oil pay, which suggested a large discovery based on the initial section penetrated. Shell then drilled an appraisal sidetrack to 25,950 feet and encountered about 380 feet of oil pay, still large by Gulf of Mexico standards.

BP plans to use cash from GoM fields for victim fund

BP, which faces U.S. opposition to drilling for oil in the Gulf of Mexico, named fields there that it will use to help finance its \$20 billion fund for victims of the worst oil spill in U.S. history.

The oil major said it would channel revenue from a number of its fields in the Gulf, including Thunder Horse, Atlantis, and Mad Dog, into its compensation fund. Thunder Horse is the largest oil discovery ever in the U.S. Gulf.

"It's quite a clever thing that BP's done which is, here are our deepwater Gulf of Mexico assets, and we're pledging overriding royalties as collateral, which should suggest to the U.S. administration not to in any way meddle with these facilities," said a Seymour Pierce analyst.

There have been concerns that the United States could ban BP from future drilling after lawmakers in July voted to pass an amendment to a bill that would prevent BP from acquiring new exploration leases after the blowout at its Macondo well in April.

A BP spokesman declined to comment on whether the move means the U.S. government has told BP or if the company expects that it will not be banned from future drilling.

Another analyst noted that BP is planning to sell \$30 billion of assets and said the deal between Chinese refiner Sinopec and Spanish oil major Repsol, announced earlier, could be driving market optimism on asset prices.

"Repsol's got a very good price for some of its assets today, so maybe people are getting hopeful on that," he said.

BP also said that the total bill for fighting the spill and compensating victims hit \$11.2 billion by Sept. 29, rising from \$9.5 billion on September 18.

The pledging of the assets is in line with the terms of the fund set out in August, when BP agreed to give the fund first priority to some oil revenues to finance its \$5 billion contribution this year and the \$1.25 billion every quarter from 2011 to 2013.

Noble Energy warns Israel on doubling gas royalties

U.S. gas company Noble Energy has warned it could take Israel to the International Court of Justice if its lawmakers go ahead with a proposal to almost double royalties on offshore gas finds. Former U.S. judge Abraham Sofaer told an Israeli parliamentary panel that any increase, the subject of huge debate in Israel, would violate agreements to devel-

op the Tamar field and be problematic for Israeli-U.S. ties.

"The U.S. government will have to decide whether to act on behalf of Noble in order to receive full compensation for the damages caused to it," a spokesman for parliament's economic affairs committee quoted Sofaer as saying.

"I don't need to tell you what a tragedy it will be if two allies like the U.S. and Israel will have to resolve dis-

agreements in a European court," he was quoted as saying.

Israel is considering raising its financial take from large gas finds off its shores, of which Tamar was the largest in 2009, but a decision is still months away. Israel currently has a 12.5% royalty rate on such finds, and lawmakers are considering raising it to 20%. They are also considering an increase in company taxes. It was unclear whether changes would be retroactive.

Shell plans to scale back offshore drilling in Alaska

Royal Dutch Shell has scaled back its plans to drill offshore the Alaska coast in 2011 and now plans only a single well for the Beaufort Sea. Shell, which has spent \$3.5 billion in preparation for the drilling, is not seeking federal permits to drill in the more remote Chukchi Sea, where it had originally planned three wells.

Unresolved litigation about the validity of Chukchi Sea leases makes it impractical to plan for drilling next year in that lightly explored region, which lies off northwestern Alaska, said Pete Slaiby, the company's vice president for Alaska.

"We've got, I think, clearer sailing in the Beaufort Sea," he told reporters at an Anchorage news conference.

The pending litigation includes a case in a Washington, D.C. appeals court in which the entire five-year Alaska leasing program was ruled improper, and a separate case in U.S. District Court in Anchorage in which the judge ruled that MMS had failed to do sufficient environmental review before selling leases in the Chukchi in 2008.

Any further exploration work in the Chukchi is on hold until the Department of Interior remedies what the courts characterized as deficiencies in pre-sale environmental work.

The litigation was launched by environmentalists and Alaska Natives who argued that oil drilling in Arctic waters poses risks of oil spills and habitat disruptions that were never adequately studied.

New drilling had also been on hold in Arctic waters because a policy announced by the Obama administration in the wake of the Deepwater Horizon disaster in the Gulf of Mexico. In concert with a moratorium on new deepwa-

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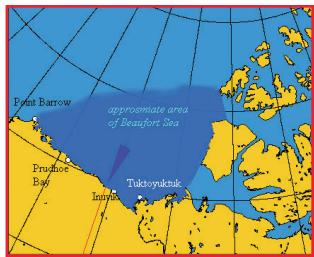
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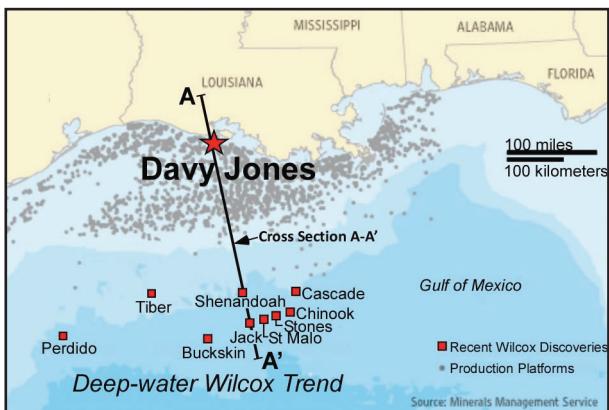
Offshore Industry

ter Gulf of Mexico drilling, the administration announced that it was temporarily delaying any permits for offshore Arctic drilling until environmental issues were better studied.

The U.S. Bureau of Ocean Energy Management, Regulation and Enforcement — the successor agency to the Minerals Management Service — has 30 days to respond to the application, according to statute, Slaiby said.

"We have every reason to believe the administration will permit 2011 exploration drilling in Alaska," Slaiby said. "The President, himself, endorsed our Alaska exploration program last spring. The administration should approve Shell's permits, put people to work, and move to validate what we believe is a valuable national resource base."

Plains sells U.S. Gulf assets to McMoRan for \$818M



Plains Exploration and Production Co. has agreed to sell its shallow water holdings in the Gulf of Mexico to partner and fellow exploration and production independent McMoRan Exploration Co. in an \$818 million cash-and-stock deal.

The transaction includes Plains' stake in Davy Jones, which could prove to be the largest natural gas discovery on the shelf in decades. Moreover, operator McMoRan believes Davy Jones is but a small slice of a larger trend (Wilcox) that extends across much of the shelf.

Plains also has started marketing its deepwater assets in the region and targets about \$1.5 billion from disposing its Gulf of Mexico interests as it moves to relatively safer onshore projects after the BP oil spill.

While Plains focuses on onshore projects like Granite Wash, California and the Haynesville shale, it keeps an interest in the Gulf of Mexico via a 23% stake in McMoRan.

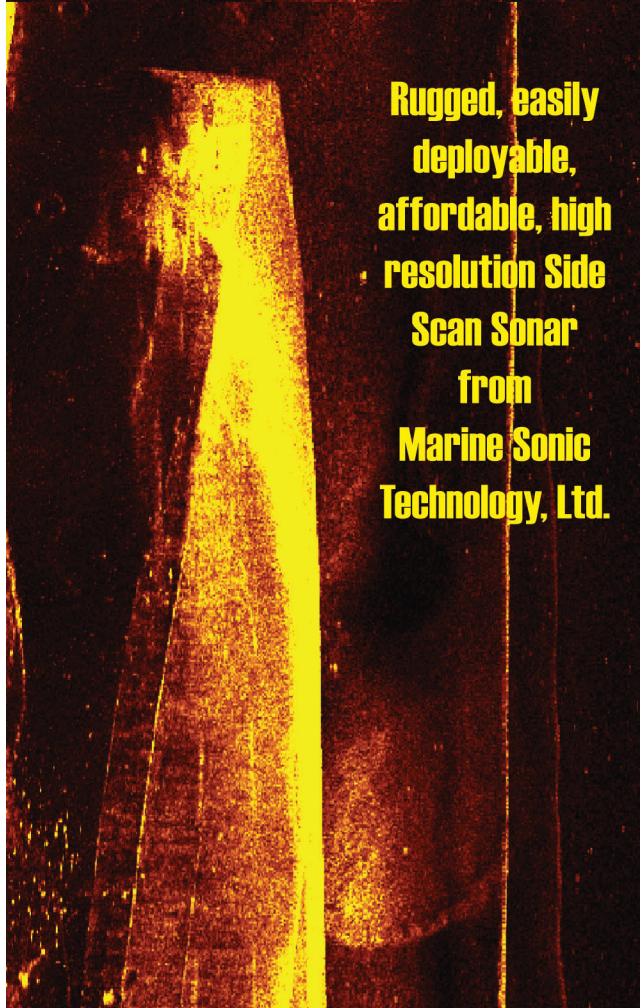
In addition to Davy Jones, Plains will sell its interest in capital-intensive properties including Blackbeard West and Blackbeard East, Flatrock field, Blueberry Hill and Hurricane Deep -- all of which it co-owns with McMoRan. McMoRan believes its ultra-deep acreage on the shelf contain multiple trillions of cubic feet of reserve potential.

Plains' deepwater portfolio is anchored by the Friesian and the Lucius prospects, with interests in 107 blocks, nine well-defined prospects and an additional 22 prospects. McMoRan will pay about \$75 million in cash and issue 51 million shares for Plains' shallow water interests. The stock part of the deal was valued at \$743.1 million.

McMoRan had about 95.5 million outstanding shares, and about \$217 million in cash and equivalents as of June 2010.

"Pro-forma for the Plains transaction and the private placement of equity and debt securities, McMoRan would have between 221 to 223 million common shares outstanding on a fully converted basis," analysts at Global Hunter Securities said in a note to clients.

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All American Marine to construct advanced survey catamaran for C & C Technologies Inc.

All American Marine, Inc. (AAM) of Bellingham, WA and C & C Technologies, Inc. (C & C) of Lafayette, LA are pleased to announce the commencement of construction of a new catamaran survey vessel. C & C Technologies recently signed a contract with All American Marine to construct a new 134-ft x 37-ft aluminum catamaran for survey operations in the Gulf of Mexico. The two companies have been developing the design concept for the advanced vessel for nearly two years. Teknicraft Design Ltd. of Auckland, New Zealand will provide the engineering and naval architecture services for the design, which is expected to be launched and delivered during the second half of 2011.

C & C worked intently with AAM and Teknicraft to make the custom-designed vessel versatile and accommodating to perform AUV operations, water sampling, side scan sonar, and multibeam operations while underway. The vessel will feature a sophisticated survey lab that functions as the control center for data collection during each mission. Transducer wells and deployable sonar struts were thoughtfully integrated into the hull to ensure quality data results. Topside, the working decks feature an impressive configuration of winches, A-frames, and cranes. The vast aft deck also provides suitable space for AUV launch and recovery operations as well as conventional geophysical surveys.

Once complete, the vessel will be kept on a busy schedule, making approximately 20 trips annually, each lasting approximately 14 days. The hull tonnage will be certified less than 100 gross tons and will include accommodations for 26 research staff



and crew. Caterpillar has been selected to supply the prime movers, inclusive of twin C32 ACERT engines and twin C18 ACERT engines. The propulsion configuration will provide a cruise speed of 20 knots with a total of 2153 bhp in each sponson. The pairing of two different engines allows for high speed transit to the survey site using all four engines and a slower survey speed when using only the smaller engines. The C18s are coupled to ZF Marine gears with trolling valves to provide an economical speed range from 3 to 11 knots. Auxiliary power for onboard electrical needs will be supplied by twin Caterpillar C4.4 gensets rated 99ekW.

For more information, visit www.cctech.us.

Remotely operated tool quickens conductor cuts

Norway's Beerenberg has won two contracts in the Gulf of Mexico for its newly developed Green Turtle conductor cutting technology, which it developed with partner CalDive International.

The patented technology is designed to provide a cost-effective method of cutting the conductor that is left protruding from the seabed after the well has been abandoned and the platform on which it was completed has been removed.

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The Green Turtle is a cylindrical tool, measuring 42 feet high and 12 feet in diameter and weighing approximately 24 metric tons. It is lowered over the conductor and excavates its way down to 15 feet below the sea surface — the depth at which the conductor must be severed — by means of water or air jetting.

It then secures itself to the conductor, after which the cutting apparatus, comprising four knives mounted on a circular frame, is activated. The knives' cutting edge is formed of synthetic diamonds. Once the upper section of the conductor has been severed, it is retrieved to the surface still held in the tool's grip.

According to chief technology officer Baste Tveito, the whole operation can normally be executed in a 12-hour shift, compared with five to six days for the conventional method, which involves the use of divers and either a diamond wire cutter or explosives. The Green Turtle method avoids diver risk, involves no damage to the local environment, and brings savings in time and cost, Tveito said. In addition, it has no inherent depth limitation, as is the case with manned diving operations.

Beerenberg and CalDive is responsible for the marine operation, including provision of a ship, were mobilizing for the first contract in late June, that involved three wells for W&T. The partners also have a one-well contract for Houston-based Apache, valued at \$316,032 to \$474,048. Further contracts are under negotiation.

The Green Turtle technology was developed by the two partners with financial assistance from Innovation Norway. Testing was only completed in May. The current tool can cut conductors up to 30 inches in diameter. Once it has some operational experience, Beerenberg plans to build a second tool capable of cutting conductors up to 36 inches in diameter.

The company has identified the Gulf of Mexico, with over 11,000 redundant wells waiting to be abandoned, as the optimum market for launching its technology, according to Beerenberg.

Technip gets underwater well-containment contract

The Marine Well Containment Co. (MWCC) awarded a contract to Technip for front-end engineering and design of underwater well-containment equipment, ExxonMobil said on the group's behalf, noting that the equipment, when complete, will be used by the MWCC to provide emergency response services in the U.S. Gulf of Mexico.

The scope of the work includes system engineering and design of specific subsea components, including the containment assembly, manifold, control umbilicals, accumulator, dispersant injection, risers, and flowlines.

ExxonMobil is leading the engineering, procurement, and construction of the marine well containment system on behalf of the sponsor companies, which also include Chevron, ConocoPhillips, and Shell. A project organization of 100, staffed from the four companies, is working full-time on the design of the new system.

"We are on schedule to develop this specialized containment equipment that will significantly increase the industry's response capabilities in the Gulf of Mexico," said Lloyd Guillory, marine well containment system project executive.

The subsea containment equipment is designed to create a direct connection and seal on a subsea well to prevent oil from escaping into the ocean. The system will be equipped with a suite of adapters and connectors to interact with various interface points, including any well design and equipment used by oil and gas operators in the U.S. Gulf.

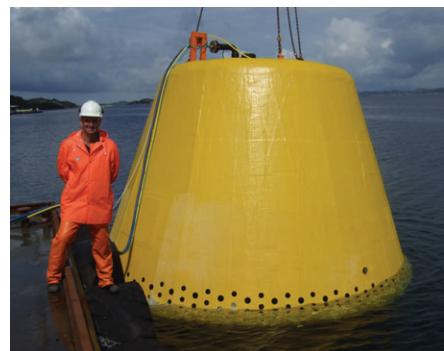
The new system will be flexible, adaptable, and available for mobilization within 24 hours of being notified of an incident and can be used on a wide range of well designs and equipment, oil and natural gas flow rates, and weather conditions.

The new system will be engineered to be used in water depths up to 10,000 feet and have initial capacity to contain 100,000 barrels per day with potential for expansion, according to MWCC.

SWIT to revolutionize water injection treatment systems

A pioneering new tool that is set to revolutionize the global industry's approach to water injection has been launched. The SWIT (subsea water injection treatment) unit takes water injection facilities from topside to seabed for the very first time, increasing oil recovery (IOR) and slashing costs by up to 50%.

Innovated by Well Processing (AS) with the majority of financing coming



from members of ITF, the oil and gas Industry Technology Facilitator, SWIT provides an alternative to traditional seawater treatment by doing everything on the seafloor, removing the need for bulky topside treatment plants.

Tests of the SWIT unit prove that the treatment has a significant effect on delaying the formation of biofilm. It also shows excellent disinfectant results and a continuous reduction in solids content.

Final full scale seabed pilot trial results show that SWIT gives 99.7% uptime compared with the industry norm of 85% to 95%.

SWIT gives freedom of choice on the number and location of injection wells, allowing for the introduction of as much treated seawater as required, where required, without typical host platform restrictions.

The technology provides two independent methods for sterilization of seawater and can also be combined with existing subsea water injection pumping equipment. By promoting increased oil recovery, SWIT enables reservoir engineers to rethink the reservoir drainage strategy and manage the reservoir more effectively, essentially getting more oil out of a field. The development of SWIT was facilitated by ITF and financed through four operating companies.

Economic evaluations show that cost reductions of between 30% and 50% would be achieved with SWIT. This has been attributed to a much simpler treatment system, utilization of 20% less power as well as a vast reduction in the use of chemicals, which will also create marked benefits for the environment.

Just over \$2 million was invested in the development of the technology, with the majority coming from ITF's members along with contributions from Norway's Demo 2000 and Well Processing (AS). ITF, the funding program of choice for the global oil and gas industry, is not-for-profit and owned by 25 major global operators and service companies.

For further information contact Gayle Nicol, senior account manager, at 01224 615019, mobile phone 07702 737135.

BMT launches Operational Client Weather and Ocean Information Center to support operations worldwide

BMT ARGOSS, a subsidiary of BMT Group Ltd, has launched a dedicated 24/7, 365 days a year operational, maritime weather forecasting center that will provide vital support for its customer's operations such as platform installations and maintenance, nearshore cable lay

operations, dredging works, ship to ship transfers, ongoing LNG terminal operations and port monitoring. The services offered by the center will help to optimize operability and minimize risks due to unexpected and unfavorable weather conditions.

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measurements, BMT ARGOSS' forecasting services are tailored to individual client requirements. Backed by extensive IT and data management infrastructure, its model systems are routinely and continuously calibrated and validated against independent observations to ensure optimal performance.

Jean-Paul Lindeboom, senior meteorologist and heading the centre at BMT ARGOSS explains: "This centre is an exciting step forward for us to support our clients in their business. Understanding customers' businesses and needs is a vital ingredient to a successful relationship, and we recognize that detailed and accurate forecasts of the environmental conditions are critical to our clients and their operations. Through our expert in-house team who have over 25 years' experience, we are fully committed to ensuring we help minimize the risks involved, by providing high quality meteorological, wave, current, and water level forecasting services."

A key aspect of the services offered by BMT ARGOSS will be its ability to provide forecasters licenced to work onsite, which will be particularly advantageous for special offshore operations such as derrick replacements and the installation of wellhead protectors in order to enhance operational efficiency and most importantly, minimize any possible safety risks to employees.

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Alaska a growing market for submarine cables

Alaska's unique geography makes it prime territory for submarine fiber optic cables. Beginning in the late 1990s, cables were built to carry traffic to the lower 48 states. More recently, however, carriers and governments have been looking to submarine cables to connect to remote parts of the state to bring broadband to isolated populations.

The proponents of one of these proposed rural networks recently applied to the U.S. Federal Communications Commission (FCC) for permission to build the submarine segment of a large broadband network in southwestern Alaska.

United Utilities, Inc. (UUI) and GCI Communication Corp. (GCIC) recently applied for a license to land and operate a non-common carrier fiber-optic submarine cable system traversing Cook Inlet to connect the Alaska communities of Williamsport and Homer. The cable system will be known as the Cook Inlet Segment of TERRA-SW. TERRA-SW is a hybrid fiber/microwave network connecting 65 villages throughout southwest Alaska to each other, to existing Alaskan fiber networks, and to the global Internet.

Globe's cable landing station provides connection between its subscribers and those of its foreign correspondent telecommunications companies. Globe is the exclusive landing party in the Philippines for the Tata Global Network-Intra Asia Cable System, a 17,000-kilometer cable network that links the Philippines to Hong Kong, China, Japan, Korea, Singapore, and Taiwan, and could be extended to other countries in southeast Asia.

RWE Innogy awards cable contract to NKT Cables

RWE Innogy and NKT Cables GmbH have signed a contract for the manufacture and delivery of high-voltage sea cable for the Welsh offshore wind farm Gwynt y Mor.

In total, NKT Cables will produce around 83 kilometers of offshore cable. The contract value is around EUR 35 million. Besides RWE Innogy, the Munich-based municipal utility company Stadtwerke Munchen, and Siemens are also involved in Gwynt y Mor Offshore Wind Farm.

"We're well on schedule with preparations for the construction of our third offshore wind farm off the coast of North

Wales," said Paul Coffey, chief operating officer at RWE Innogy. "With contracts in place for the supply of turbines, substations, and offshore export cabling, we have now secured the key project components to enable us to begin with offshore construction as planned in the autumn of next year."

In total, NKT Cables will produce four 132 kV high-voltage offshore cables for RWE Innogy at its newly built cable plant in Cologne. Manufacturing should begin at the end of 2011 and be completed in mid-2012.

When manufactured, the high voltage submarine cables will be taken via the Rhine to Rotterdam. A special cable-laying vessel will deliver the cables to Liverpool Bay off the coast of North Wales. Later, these high voltage cables will transmit the energy produced by the total of 160 wind turbines of the Gwynt y Mor wind farm across 20 kilometers to the coast, where the closest feeding point on land is located at St. Asaph.

Each of these cables is around 20 centimeters thick and protected with a robust armoring against the extreme loads at high sea, such as corrosion or abrasion through tides and waves. At the same time, these cables enable a maximum energy transmission over long distances.

Construction of the transformer substation on land has already begun. The building work at sea will start in the autumn of 2011. From then on, 160 x 3.6 megawatt wind turbines will be installed at the wind farm site around 13 kilometers off the coast of North Wales in water depths of between 12 and 28 meters.

The work will be carried out from one of the world's biggest offshore construction ships. RWE Innogy has placed an order for the building of two of these ships, each valued at around EUR 100 million, with a Korean shipyard. Gwynt y Mor is scheduled to begin exporting energy in 2013, with the wind farm expected to be completed in 2014. Once fully constructed, the wind farm will have an installed capacity of 576-MW, capable of generating enough clean electricity energy to meet the energy needs of the equivalent of around 400,000 UK homes every year.

In parallel with the construction of Gwynt y Mor Offshore Wind Farm, RWE Innogy is building the Nordsee Ost Offshore Wind Farm (295-MW) in German territorial waters, and this is due for completion in 2013.

Global Marine Systems installs cable for Gjøa floating platform

Global Marine Systems has announced the successful completion of the Gjøa power cable installation. Gjøa is the first ever floating platform to have power supplied by a direct link from shore and will contribute to a greener source of energy, reducing carbon emissions by an estimated 210,000 tons a year.

Working together, Global Marine Systems and ABB installed the submarine cable, which brings electricity from the Mongstad refinery, north of Bergen, Norway, to the oil and gas company's floating production platform in the North Sea.

Gjøa's 100-kilometer high-voltage AC power cable passes through up to 544 meters depth of water and is the world's longest power link to an offshore platform. Installation of a cable to such a depth, over subsea cliffs and very rough subsea terrain, poses significant challenges requiring the utilization of innovative installation techniques.

As senior project manager, Bruce Manning explained, "When laying this type of heavy cable in deep water, control of the lay tension is vital to ensure the cable is not damaged. This is principally achieved by monitoring the point that the cable touches the seabed using a remotely operated vehicle," he said. "The installation process needed to be highly controlled as waves can exceed 7 meters in height (even in summer) and pose a significant challenge. Lay vessel motion would induce unacceptable stresses into the cable, which were alleviated by use of a heave compensated lay chute - the first time this has ever been done."

To guarantee a successful outcome further protection for storm conditions was also made through temporary buoyancy systems that could be rapidly deployed immediately before a storm hits.

The Gjøa cable installation was completed on May 17, 2010 using the lay vessel NO102.

New Mediterranean cable system enters service

A new submarine fiber optic cable system has entered service that will help meet the growing demand for bandwidth in the Eastern Mediterranean.

Cyprus Telecommunications Authority (CYTA) has announced the commercial operation of the Cyprus-France segment of its new submarine cable subsystem, ALEXANDROS.

Submarine Cables

The ALEXANDROS subsystem is the result of the strategic co-operation agreement between CYTA and Telecom Egypt (TE), according to which CYTA participates on an ownership basis in the TE submarine cable system, TE North (TEN), connecting Egypt with France.

The TEN system has been constructed by Alcatel-Lucent and utilizes eight fiber pairs with total capacity of more than 10 Tbps. The system is equipped with branching units that enable it to be extended to selected countries in the Mediterranean, thus creating a communication bridge between these countries, Europe, Africa, and Asia as well as business opportunities in the Mediterranean and Eurasia.

Under the agreement, the TEN system has been extended to Cyprus via a direct branch, and CYTA has acquired separate fiber pairs between Cyprus and Egypt and between Cyprus and France, each with 96 x 10 Gbps total capacity. The agreement also allows for an option of extending ALEXANDROS subsystem to Greece. The Cyprus-Egypt segment of the subsystem will come into commercial operation in the coming few months, along with the rest of the TEN system.

Through the extensive international telecommunication infrastructure of CYTA, comprising submarine cable systems connecting the island with neighboring countries and other international destinations, Cyprus currently constitutes a major telecommunications hub in the Mediterranean region.

Through the ALEXANDROS subsystem, CYTA achieves an optimum configuration for its business needs, enhancing connectivity in the Mediterranean and providing international network robustness and reliability, the company said in a statement. At the same time, ALEXANDROS allows CYTA to provide high-quality bandwidth to other telecommunication providers and access new markets, serving the international telecommunication needs of Cyprus in general.

Aker Solutions gets subsea umbilical award from Noble Energy

Aker Solutions has been selected to supply further subsea umbilicals for leading US independent oil and gas

company Noble Energy, Inc. The deal is worth approximately NOK 270 million.

This latest order is an exercise of options agreed to under the initial NOK 650 million umbilical contract, which was announced on 9 April this year. The subsea umbilicals will be used at Noble Energy's Tamar deepwater project in the Mediterranean Sea.

The latest order is for approximately 105 kilometers of steel tube umbilicals,

bringing the total order from Noble Energy up to 330 kilometers of subsea umbilicals.

Engineering and project management will be provided from Aker Solutions' facility in Mobile, Alabama, where the umbilicals will be manufactured also. Estimated delivery date is the third quarter of 2011.

Aker Solutions' contract party is Aker Subsea, Inc.

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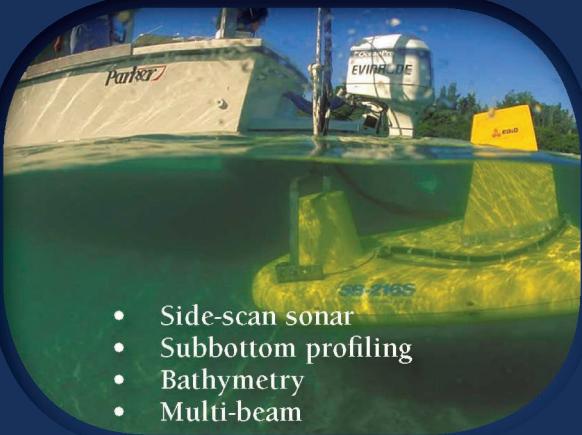
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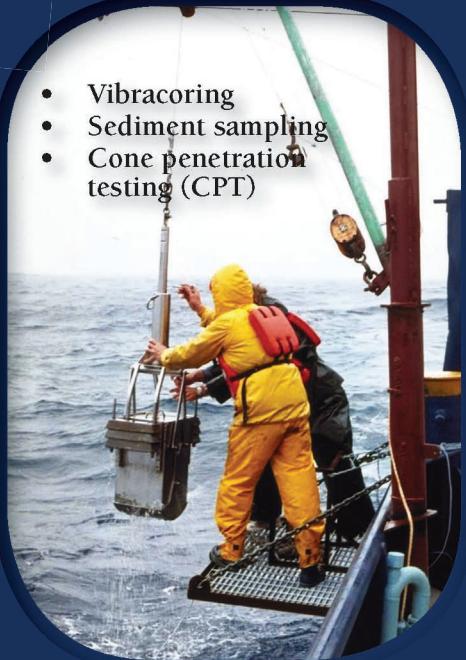
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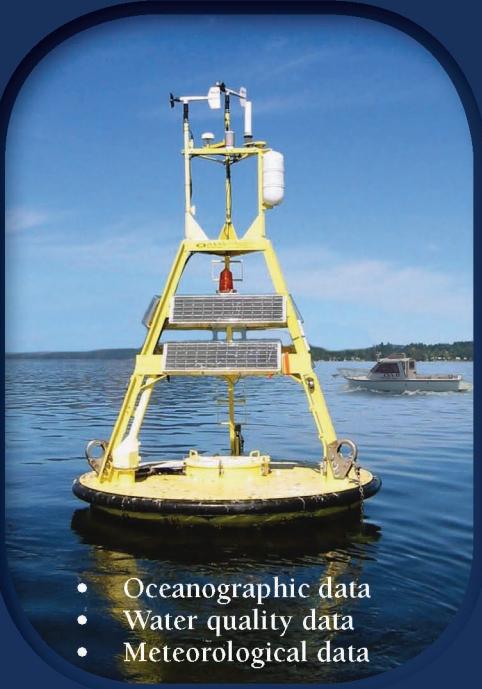


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Everybody Loves a Shipwreck

By: Andy Wilby

Chief Engineer, Applied Signal Technology, Inc.

Introduction

Everybody loves a shipwreck. From the horror of Titanic to the mystery of Amelia Earhart, tragedy at sea has fueled a thousand Hollywood blockbusters. The ethereal images that sonar is able to bring back from the deep evoke an ingrained fascination that is hard to beat.

When I was asked to write this article, the first thought was “so, which shipwreck should I put on the front cover?” I chose instead to recognize that for the majority of its life, an imaging sonar system is not used to look for wrecks, but to trawl, mile after mile, examining boring seabed, whether it is inspecting a pipeline, evaluating potential routes for new seabed infrastructure, or assessing the environmental impact of our intervention in the underwater world.

A sonar system needs to be reliable, able to run for 24 hours per day, 7 days a week, with little need for intervention from the operator. The system needs to be capable. The job of a sensor such as a sidescan is to allow the operator to interpret what is present on the seabed, not to interpret what is happening with the sensor. The system needs to be cost effective and affordable.

Over the past few years, Applied Signal Technology, Inc. (AST) has continued working with Synthetic Aperture Sonar (SAS) technology to provide an improved side-look imaging capability. The program is mature and the product line, a series of sonars called PROSAS™ Surveyor, is available and deployed out in the oil fields and oceans providing seabed imagery to a variety of customers.

SAS was born in the military. The capability to provide fine resolution images of objects at long ranges was a natural fit with the needs of the modern-day mine hunter. With the military tag came multi-million dollar price tags; system complexity, which was unmaintainable in a commercial workplace; an understanding that more resolution was always better, whatever the cost; and an acceptance that the system could be called complete, when, in

reality there was still a scientist under the counter manipulating every image that was published to extract the last dB of integrated sidelobe performance. Somehow, it seemed acceptable for SAS to be this way, because SAS had always been this way. Because of this, SAS technology was largely ignored by the commercial world as unattainable and, probably, not worth the bother.

In mapping out the PROSAS Surveyor product line, we asked ourselves a number of fundamental questions and have now produced a commercially viable system, suitable for use in the oil and gas industry: How much resolution do we really need to provide a step improvement in the capabilities of an operator to interpret what they are seeing on the seabed? How do we get the system price down to a level not much more than a high-end sidescan? How do we make a system that makes the operators’ life easier and improves the time from the start of survey to getting the report in the hands of the customer?

Performance

Performance is not ultimately about the integrated sidelobe response of a beamformer (although that is an important factor in SAS design). It is concerned with how easy a system is to use and how effective the system is in getting the client the information, that they need about the area being surveyed.



PROSAS Surveyor in AUV configuration on a 12" Bluefin vehicle (right) and in a towed configuration on a MacArtney Focus vehicle (above).

Within an hour of using the PROSAS Surveyor system, the operator is fully trained in the function of the system. Within 2 hours, they have forgotten the term synthetic aperture and are concentrating on looking at a detailed sidescan image. Within 3 hours they are bored, but thankful that the end of the job is probably nearer than it would have been with the tool they were using last week.

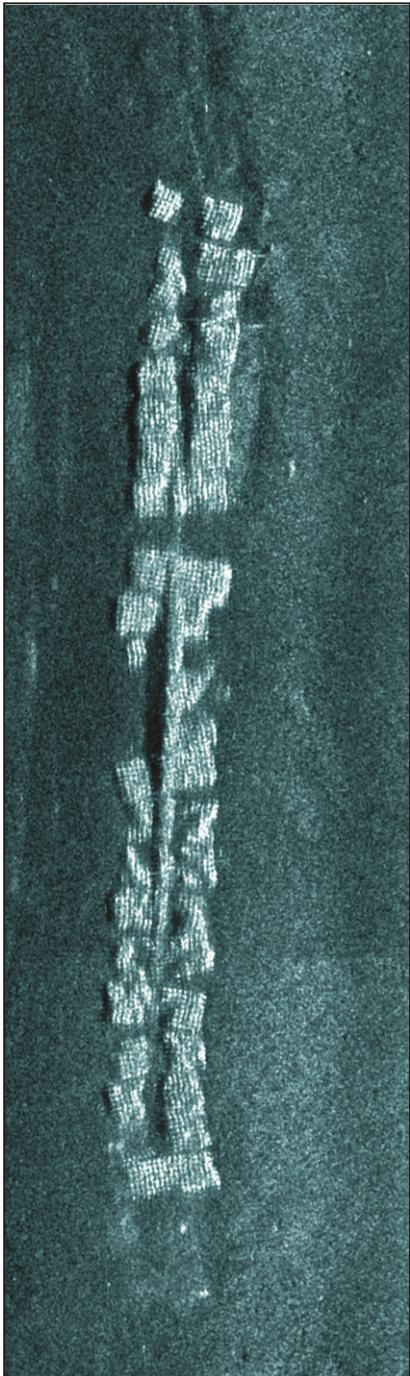
PROSAS Surveyor is designed to look and feel just like any other sidescan. The operator can simultaneously view a waterfall of conventional sidescan, a waterfall generated using the synthetic aperture, and a third waterfall that provides real-time interferometric bathymetry from the array. In parallel with these quality control tools, the system automatically generates full-resolution GeoTIFF images from the waterfalls that during the course of the survey, may be pulled from the system and incorporated into an AutoCAD drawing of the pipe infrastructure, a Hypack mosaic, or a Google Earth rendering of the seabed. At the end of each leg, preliminary data are already in a form ready to provide to a client, allowing the surveyor to judge if the data gathered are of sufficient quality to proceed or if a leg needs to be re-run.

The PROSAS Surveyor also provides a contact management and targeting capability. Using the cursor, the operator clicks on objects on the screen, and a small GeoTIFF image of the selected object is generated and ready for uploading to a chart. HTML documents are linked to the full-resolution images, providing a notebook on each of the contacts giving position, survey parameters, and other pertinent metadata.

Resolution

There are many beautiful images of seabed objects out in the galleries of sidescan manufacturers. The best of these are, of course, produced by high-frequency sonars at very short ranges. If you take the time to pore over the specifications for these sonars and try to work out their performance, you may conclude that the along track resolution of all but a handful of very specialist instruments is of the order of a few inches and the across track resolution is normally no better than around an inch. With our system, we decided that if we could make a sonar that could provide a 1 inch by 1 inch resolution all of the way across a wide swath, maybe 5 to 10 times that achievable with a high-frequency sonar, then we would be able to provide an order of magnitude improvement in the capability of the operator to do his work. Our baseline sonar system operates at 175 kHz. It can be configured for operation on either a towed vehicle or an AUV and will provide constant resolution images out to ranges in excess of 200 meters.

Why is this useful? The image on the front cover of this journal shows a waste dump area off the coast of



Pipe exposure covered with concrete mattress in the Gulf of Mexico

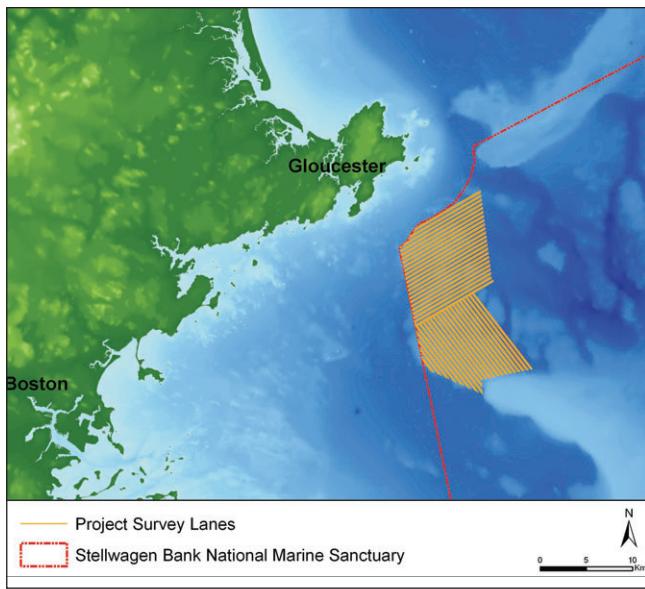
Boston. The picture was taken with PROSAS Surveyor installed in a Bluefin 12" AUV. It is possible to see the whole structure of the dump, see where each individual barge load fell to the seafloor, and understand how the waste has spread out over the seabed through time. In one pass, we can assess the environmental impact of this dumping in a way and with a clarity that would have required an entire mosaic of data from a high-frequency sensor, obtained over many passes.

Last year, we were in the Gulf of Mexico, involved in a number of surveys of pipe exposures and the mattresses that had been laid on the seabed to cover these exposures and protect the pipe. Because of the constant resolution with range, a feature of SAS, we were able to place the pipe some distance out into the swath and not worry about loss of resolution due to poor navigation.

The images obtained were of sufficient clarity that the surveyor was able to extract all of the information they required without the need for cross runs. This saved time. We finished the survey in half of the allotted hours.

Price

Don't build a Ferrari when your customer only needs an F150 pickup. The temptation, particularly in the military design world, is to think that more is always better. In synthetic aperture sonar, the resolution of the system is defined by the length of each element within the transducer array (the smaller the elements, the higher the resolu-



Archaeological survey conducted in the Stellwagen Bank National Marine Sanctuary for NOAA. Survey was conducted during a 1 week period, 24 hours per day. (Image courtesy of NOAA/Stellwagen Bank National Marine Sanctuary)

tion) and the range/speed performance is determined by the length of the array. If you want a sonar that can work at long ranges, you need a long array. If you want it to work at high resolution, you need small elements. This all adds up to more complexity in the transducer design, more channels of acquisition electronics, more expensive connectors to pass signals to the processing system, and more data to process on more powerful computers. All of this costs money, adds to the complexity of the system, adds to the power required to run it, and reduces the reliability of the final product.

In the design of PROSAS Surveyor, we deliberately reduced the complexity of interfaces as well as the number of channels in the array. We designed hardware that is easy to maintain, is low power and reliable, but is also simple to produce and affordable to the user.

It is easy to show that the improvement in area coverage rate of a SAS system, even a million dollar SAS system, when compared to the use of a conventional sidescan will pay for itself in a few days or weeks of survey by trading increased productivity for vessel hours. This issue is rather that there is an initial outlay for equipment to be paid for and the procurement of that equipment requires that the operator looks forward to project the utilization rate and, hence, the return on investment that equipment will provide. The larger the capital cost, the further into a cloudy crystal ball the operator is forced to gaze and the more skeptical the controller of the purse becomes.

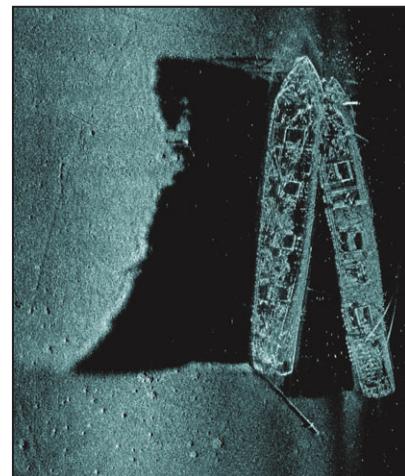
The unit cost for a PROSAS Surveyor system is similar to that of a high end sidescan. Our reasoning for this was that commercial operators have demonstrated the ability

to look into the future far enough to justify the price of these systems and, with the increase in productivity that SAS offers over conventional sidescan, there should be less prophesy involved in justifying the purchase of PROSAS Surveyor. Our determination to maintain an entry-level system at this price point has dictated a level of performance is not as high as that achievable from some military systems, but, the proof of the pudding is in the eating (so it is said). The images produced by the PROSAS Surveyor system take the guesswork out of interpretation of seabed geology and topography and provide a significant capability enhancement when compared to conventional sidescan technology.

Conclusion

PROSAS Surveyor is a real tool, ready for real work. The system costs are comparable with those of a high-end sidescan, but offer a level of performance that will improve the effectiveness of the time spent at sea surveying and improve both the quality and the timeliness of data for your clients.

The standard system is available in both towed and AUV configurations for operation in 3,000 meters of water. Deeper systems are in production.



Shipwreck of Frank A. Palmer and Louise B. Cray. The ships were each carrying 3,000 tons of coal from Newport News, Virginia to Boston when they collided during the gale on December 17, 1902 and sank together. Eleven of the 21 sailors lost their lives. Image generated during recent survey, courtesy of NOAA/Stellwagen Bank National Marine Sanctuary.

... It also makes great pictures of shipwrecks...
(Sorry, couldn't resist!)

For more information visit: www.appsig.com

About the Author

Andy Wilby has been Chief Engineer with Applied Signal Technology, Inc. since 2004. Formerly with Ultra Electronics in the UK, he has been working within the sonar industry for 24 years, developing sensors and sensor processing systems for mine hunting, ASW, and commercial applications.



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France booked 2009 arms export orders worth 8.16 billion euros (\$11.31 billion), a 22 percent rise over the previous year, showing a climb out of the lows hit in the middle of the last decade, Defense Ministry spokesman Laurent Teisseire said. Brazil was France's biggest export customer last year, thanks to its purchase of four Scorpene-type diesel-electric submarines and a partnership deal estimated at 6.7 billion euros. In 2008, France reported orders worth 6.58 billion euros; in 2007, 5.5 billion euros. With the latest figures, France held its rank as the fourth-largest arms exporter, with a 7.2 percent share of the world market.

A small group of engineers and financiers previously known for promoting a low-cost class of new fleet oilers has emerged as the first publicly acknowledged bidders for the Northrop Grumman shipyard empire. Northrop, whose three major shipyards make it the largest U.S. shipbuilder, announced 13 July its intention to sell or close its Avondale yard in Louisiana and offer the Newport News yard in Virginia and Ingalls yard in Mississippi as a package deal, all part of a move to leave the shipbuilding business. Cleveland Ship is the first bidder to publicly confirm its interest, and the first to indicate a desire to buy all three shipyards.

Both industry teams contending to build the next Littoral Combat Ships submitted their "final proposals" September 15, and are now awaiting a decision in the U.S. Navy's premier shipbuilding competition. Lockheed Martin and Austal USA are competing to have their design selected as the basis for at least 51 more LCS ships. Along with the design selection, the Navy also will award contracts for a batch of 10 ships to be ordered between 2010 and 2014.

Spain and the Seychelles on September 14 signed two agreements aimed at fighting piracy in the Indian Ocean, where Spanish trawlers have been among the regular targets of Somali kidnappers. Unofficial figures show 2009 was the most prolific year for Somali pirates, with more than 200 attacks - including 68 successful hijackings - and ransoms thought to exceed \$50 million. Spanish trawlers fishing in the Indian Ocean have been among those regularly targeted.

The three industry teams vying to create what could be the follow-on to the U.S. Navy's Aegis radar combat system received new technology development contracts September 30 as the Pentagon rushed to dole out money before the end of the fiscal year.

Northrop Grumman, Lockheed Martin, and Raytheon each received a contract to continue development of the new Air and Missile Defense Radar (AMDR), a system the Navy hopes to install on different types of ships. Northrop's award was for \$120 million; Lockheed's, \$119 million; and Raytheon's, \$112.3 million. The new contracts carry enough work for the next two years, or until September 2012.

Portable Undersea Training Facility Ready to Exercise



A Portable Undersea Training Range transponder is launched from a Navy support vessel during a recent test run in the Pacific Ocean. The PUTR provides a realistic environment to support undersea warfare training for forward deployed naval forces. (U.S. Navy photo)

The Portable Undersea Training Range, located at the Pacific Missile Range Facility Kauai, Hawaii, completed a major operational evaluation in July.

During the test, the range, also known as PUTR, accomplished key performance requirements, such as accuracy in target identification and continual target observance. Additionally, the U.S. Navy retrieved all acoustic transponders at completion of the exercise, signifying a major achievement.

According to Robert Reid, technical program manager, transponders are deployed with an anchor and remain moored to the ocean floor for the duration of the operation. At the completion of the test, the range support ship transmits an acoustic release signal for flotation to the surface.

The range is a self-contained, portable, undersea training system equipped with multiple transponders that accurately determine the position of various underwater participants, including submarines, surface ships, unmanned undersea vehicles, weapons, and mobile targets. It also supports in-water tracking of weapons deployed by naval aircraft.

"The success of this test is a huge step toward providing the U.S. Pacific Fleet an accurate, instrumented undersea training range in the western Pacific," Reid said.

The PUTR is being developed by the Naval Aviation Training Systems program office (PMA-205), Naval Air Station Patuxent River, MD, in conjunction with the Naval Undersea Warfare Center, Newport, RI.

It will provide forward-deployed naval forces an effective means to conduct Undersea Warfare Exercises, also known as USW, at various ocean sites and depths.

The range employs modern technologies to support coordinated USW training for forward-deployed naval forces components to include mission-capable surface ships, fast-attack submarines and aircraft, by providing a location to safely and effectively conduct training as well as exercise and evaluate sensor systems, weapons systems, and crews in situations that replicate potential combat areas.

The basic PUTR operational configuration consists of an array of bottom-mounted transponders, a transponder subsurface link (hub), a range support vessel with a shipboard range operations center, and a satellite link to a shore-based remote display center.

The range can be deployable to multiple locations with a PUTR system and will be ready for operational exercises late fall 2010.

Austal commences construction of JHSV 2

Less than one year after beginning fabrication of Spearhead (JHSV 1), Austal has commenced construction on Vigilant (JHSV 2), the second of up to 10, 103-meter Joint High Speed Vessels (JHSV).

On July 22, 2010, the official Keel Laying Ceremony was held at Austal's shipyard for Spearhead (JHSV 1), which is on schedule for launch in June 2011 and delivery in December 2011. Austal was selected as prime contractor in November 2008 to design and build the first JHSV, with options for nine additional vessels expected to be exercised between FY09 and FY13. Since then, Austal has received construction contracts for JHSV 1, JHSV 2, and JHSV 3 and Long Lead Time Material contracts for JHSV 4 and JHSV 5.

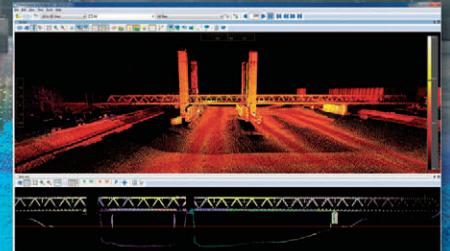


As the U.S. Department of Defense's next generation multi-use platform, the 103-meter JHSV will provide rapid intra-theater deployment/transportation of personnel, equipment, and supplies. The vessel will support military logistics, sustainment, and humanitarian relief operations and will be capable of speeds up to 43 knots. Proof of the value of this program for humanitarian efforts was evidenced in January 2010 when the Austal-built 113-meter aluminum catamaran, Huakai, was successfully deployed to transport members of the U.S. Army's Transportation Corps from Ft. Eustis, Virginia, along with their

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equipment, to Haiti following the earthquake that devastated that region less than two weeks prior to Huakai's arrival.

U.S. Navy Program Manager, Capt. George Sutton said, "The start of JHSV 2 represents the first Navy/MSC ship and the start of serial production. Serial production is the key to program stability, affordability, and efficiency for the ship-builder and the taxpayer."

Spearhead (JHSV 1) is the first Austal design to be constructed using the new procedures and processes developed in conjunction with Austal's Module Manufacturing Facility (MMF). The MMF provides Austal with assembly line efficiency, which should result in significant cost savings and reduced lead times.

Austal USA president and chief operating officer, Joe Rella, commented, "Since the beginning of the year, Austal has added over 800 employees to our staff of shipbuilding professionals. Our workforce is well positioned to start construction on this second JHSV."

The Austal JHSV will transport medium-size operational units with their vehicles or reconfigure to provide troop transport for an infantry battalion, allow-

ing units to transit long distances while maintaining unit integrity. The vessel also supports helicopter operations and has a slewing vehicle ramp on the starboard quarter that enables use of austere piers and quay walls, common in developing countries. A shallow draft (under 4 meters) will further enhance theater port access.

The Austal JHSV team includes platform systems engineering agent General Dynamics Advanced Information Systems, who is responsible for the design, integration, and testing of the ship's mission systems, including internal and external communications, electronic navigation, and aviation and armament systems.

Austal USA is also currently building a second Independence-class 127-meter Littoral Combat Ship (LCS) for the U.S. Navy, Coronado (LCS 4). USS Independence (LCS 2) is currently being put through trials by her crew after the U.S. Navy officially took delivery in December 2009 and she was commissioned earlier this year in January 2010. As prime contractor, Austal is in the process of completing final proposal

revisions for the next LCS 10-ship contract, which should be competitively awarded by the U.S. Navy before the end of the year.

Donilon to replace Jones as Obama's National Security Adviser

The White House announced October 8 that U.S. National Security Adviser James Jones is stepping down and will be replaced by his deputy, Tom Donilon.

The expected promotion of Donilon puts to rest months of speculation that Marine Gen. James Cartwright, vice chairman of the Joint Chiefs, would replace Jones.

Donilon was Chief of Staff to Secretary of State Warren Christopher during the Clinton administration. He also was a top adviser to Vice President Joseph Biden's 1988 presidential campaign, and then advised Massachusetts Gov. Michael Dukakis' presidential campaign after Biden bowed out. He was an executive at Fannie Mae from 1999 to 2005, and advised Biden on Iraq during the 2008 presidential campaign. After the election, Donilon ran the Obama State Department transition team.

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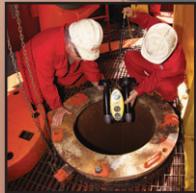
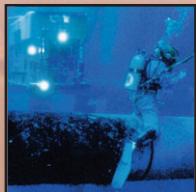
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The Survey and IRM markets are growing at an impressive rate. Energy business analysts have forecasted an offshore operations and maintenance expenditure of more than \$330 billion over the next five years—with the largest share allocated to North America.

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- Advanced and Future Remote Inspection and Operation

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Subsea Survey IRM

www.subseasurvey.com

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Subsea Survey, now in its 5th year, will again focus on the technology related to seafloor survey and mapping operations and expands the scope of subsea survey.

Traditionally, survey has referred to mapping the seafloor, but survey also means to perform an inspection and/or to perform a detailed examination in order to discover any defects, and usually results in a map or report. Beginning in 2010 Subsea Survey will go a step further and enter the realm of inspection, repair and maintenance.

Subsea Inspection, Repair and Maintenance (IRM) refers to tasks carried out on offshore infrastructure below the water line in order to maintain production and ensure suitable HSE standards are met. The IRM market is divided into 3 subsea categories:

- Pipelines including risers and umbilicals
- Fixed Platforms
- Subsea Wells-intervention & field inspection

Subsea IRM Market to outgrow all other market sectors

Today, the Survey and IRM markets are growing at an impressive rate. Late last year energy business analysts Douglas-Westwood Ltd. forecasted 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 period.

The analysts also predict the IRM market will grow more than 10% between 2010 and 2015. The trend towards deepwater reserves has led to substantial growth in subsea drilling and completion markets which in turn will see the stock of completed wells more than double between 2005 and 2012. Similarly, the installed base of subsea pipelines is also expected to grow substantially over the next five years. In addition, the stock of subsea completed wells and pipelines is expected to grow substantially over the same timeframe—and all this equipment will require significant levels of ongoing inspection, repair and maintenance work.

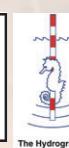
Subsea Survey IRM will focus on the technology and methodology of seafloor survey and mapping operations, along with the technology to meet the offshore industry's inspection requirements and enable effective repairs and maintenance to be accomplished by divers, ROVs, AUVs and remote monitoring systems.



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General Session—Tuesday, November 9th

9:00

Opening Session Keynotes & Panel

9:15

Keynote Speaker

Steven Kopits, Managing Director, Douglas Westwood LLC

Douglas-Westwood has authored the recent report titled *The World Offshore Operations & Maintenance Report 2010-2014*. The challenge of meeting global energy demand is pushing Oil & Gas companies to the limits of technology by developing reserves in increasingly deeper water and under higher pressure and temperature conditions than ever before. However, every offshore project adds to the already massive infrastructure of subsea oil & gas related equipment. **Steven Kopits** examines the impact of prospective offshore oil & gas activity on the subsea inspection, repair and maintenance (IRM) market considering key market drivers and indicators and their effect on this rapidly growing portion of the offshore oil & gas business.

Steven Kopits heads the New York office of Douglas-Westwood, providing market research, strategy support and commercial due diligence to the offshore oil and gas services sector, investment banks, and private equity funds. Steven's background is as an investment banker and management consultant. Prior to joining Douglas-Westwood, Steven led teams raising capital for the shipping and offshore oil and gas sector as an investment banker in New York; and earlier provided strategic management consulting services to a range of industries as a Director for Financial Advisory Services at Deloitte & Touche. He presents frequently on a range of oil and gas topics, and writes regularly on energy markets in a variety of publications, including Offshore Magazine, Petroleum Review, Foreign Policy and Renewable Energy World.

Douglas
Westwood



10:00

Keynote Speaker

Randall Abadie, P.E., F. ASCE, Offshore Structures Technical Authority - Upstream Americas, Marine Technical Authority - Upstream Americas, Shell Exploration and Production Company

Driving Success In Offshore Oil and Gas Operations Through The Use of Underwater Service Contractors

The use of underwater service contractors is a must for offshore oil and gas operations. The presentation will discuss how the use of these services help drive success in offshore oil and gas operations, both in shallow water and deepwater. The presentation will highlight several successful projects where underwater services played a key role, discuss HSE issues facing the underwater industry and outline how continuous technology advancement will be a key component for the success of the offshore oil and gas industry going forward in a new operating environment.

Randall Abadie is employed by Shell Exploration and Production Company in New Orleans, Louisiana where he serves as the Offshore Structures Technical Authority, Marine Technical Authority, and Diving Technical Authority for Shell Upstream Americas. He is responsible for all diving activities for Shell Upstream in the Americas, all underwater inspections for Shell in the Gulf of Mexico and is the focal point for decommissioning of offshore structures and facilities for Shell in the Gulf of Mexico. Prior to joining Shell he spent a number of years working for a large engineering design firm in New Orleans, Louisiana where he designed and managed numerous large-scale oil and gas and industrial projects around the world. Randall is a graduate of Louisiana State University and is a registered professional engineer in the states of Louisiana, Texas, Alabama, and Mississippi. He is a charter member of the Structural Institute and in 1999 was named a Fellow in the American Society of Civil Engineers. He has served on a number of industry committees and groups, and is Shell's representative on the Gulf of Mexico Decommissioning Operators Group.



General Session—Tuesday, November 9th (continued)

10:45

Keynote Speaker

Edward C. Gough, Jr., Deputy and Technical Director, Naval Meteorology and Oceanography Command

Naval Oceanography represents world-leading operational oceanography, with global sensing and ocean modeling supporting an agile force of decision makers with innovative information products. Mr. Gough will discuss the Navy's breakthrough innovations, including "gliders" that they have been pioneering and will present recent Gulf of Mexico modeling & activities after the oil spill as an example.

Edward C. Gough was an engineer at Sperry Marine Systems in the Advanced Products Group and from 1977 through 1989, he was principal scientist with Planning Systems Inc. Ed was Principal Engineer at the Applied Physics Laboratory, The University of Washington from 1989 until 2003. He joined as head of the Signals and Systems Department, and later served as head of the Environmental and Tactical Systems Department. From 1993 until 1995 Mr. Gough was Science Advisor to the Navy's Sixth Fleet commander in the Mediterranean Sea. From 1996 until 1998 Ed served as Technical Director of OPNAV N84, the ASW Requirements and Assessments Division of the Chief of Naval Operations Staff. And he served as the Science and Technology Advisor to the commander of the U.S. Pacific Command from 2002 until 2003. Ed joined the Naval Meteorology and Oceanography Command as Technical/Deputy Director in August 2003.



12:00

Lunch

Track 1—Tuesday, November 9th

Integrity Management

Comprehensive Approach to Subsea Integrity Management

John D. Green, Engineering Manager, Stat Marine, LLC

2:00

Pipeline Inspection Data in a 3D Environment

Lars Dall, Survey Manager, EIVA A/S Denmark

2:30

Using 3D Visualization for Life of Field Asset Integrity Management

By Paul Evans, VisualSoft USA

3:00

Break

Diving—IRM & Vessels

Dive Service Vessels (DSVs) for the 21st Century

Michael Johnson, Proposals Manager - Diving, Oceaneering International, Inc.

4:30

The NEPSYS Underwater Dry Weld System

Richard Campbell, Neptune Underwater Services. LLC

5:00

Advanced NDT of Subsea Riser Welds

James R. McNabb, MSc, MInst NDT, Global Technology Manager, Inspection, Oceaneering International, Inc.

5:30 pm Exhibitor's Reception —Exhibit Hall

Track 1—Wednesday, November 10th

Underwater Vehicles for Survey , Inspection, Repair and Maintenance

- 8:30 **Future Shock, Today's Technology and IRM Interventions**
 Dave Medeiros, Project Manager, Oceaneering International, Inc.
- 9:00 **ROV Design Challenges for Today's Deepwater IMR Market**
 Jason Stanley, VP Sales Schilling Robotics
- 9:30 **Subsea Survey, Intervention and Inspection – A New ROV Systems Approach To Day-Cost Containment**
 Ian Griffiths, SMD Americas – General Manager & VP Norm Robertson, Consultant
- 10:00 **Break**
- Underwater Vehicles for Survey , Inspection, Repair and Maintenance
- 11:00 **Low logistics AUVs for Pipeline Inspection & Hydrographic Surveys**
 Andrew McMurtrie, NCS Survey
- 11:30 **HUGIN 1000 AUV with Interferometric SAS for Pipeline Inspection**
 Chris Hancock, Kongsberg Underwater Technology, Inc.
- 12:00 **Lunch**
- Underwater Vehicles for Survey , Inspection, Repair and Maintenance
- 1:30 **Seaeye Sabertooth Hybrid AUV/ROV for IMR**
 Jack Roberts, Saab Underwater Systems AB
- 2:00 **Technology Advances Bring Autonomous Vehicles Operations into the Oil Field**
 Dan McLeod, Sr. Program Manager, Lockheed Martin MS2
- 2:30 **Extending Range and Lowering Cost for Offshore IRM Missions through New ROV Designs**
 Jonathan Epstein, President and CEO, Hawkes Remotes, Inc.
- 3:00 **Break**
- Underwater Vehicles for Survey, Inspection, Repair and Maintenance
- 4:00 **Latest Advances on Smart Technology for Remotely Operated Vehicles Improve Operations**
 Dr. Ioseba Tena, Sales Manager, SeeByte Ltd.
- 4:30 **Innovative New Autonomous Underwater Vehicles for Offshore Survey Applications**
 David Shea, Marport Canada, Inc.
- 5:00 **ALISTAR 3000, an AUV to Perform Survey Construction Support Tasks**
 Jacques Schoellkopf, Director, Advanced Subsea Inc.

Track 2—Wednesday, November 10th

Subsea Networks & Monitoring

8:30 The CSnet Offshore Communications Backbone (OCB), A Modular Deployable Ocean Observing System, Dr. Andrew M. Clark, President/CEO, CSnet International

9:00 Subsea Inspection Repair and Maintenance Benefit from Free Broadband Communication Perry Wright, Director, Integrated Subsea Systems, Ocean Specialists, Inc.

9:30 A Distributed Micro Sonar Network (DSMN) for Marine Mammal Mitigation and Asset Security During Offshore Oil & Gas Operations, Nicholas A. Rotker, Research Scientist, Scientific Solutions, Inc.

10:00

Break

Tools of the Trade

11:00 Recent Advances in Offshore Pipeline Cathodic Protection Life Extension & Performance Monitoring. Jim Britton, CEO, Deepwater Corrosion Services Inc., Houston, TX.

11:30

Review of Methods for Pipe Walking & Lateral/Upheaval Buckling Detection Jacques Schoellkopf, Director, Advanced Subsea Inc.

12:00

Lunch

Tools of the Trade

1:30 Pushing the Limits of Underwater Video Bengt Sahlberg, CEO, LYNN AB

2:00

PROSAS Surveyor: Out of the Lab and into the Oil Field Stephen Ruddy, Commercial Manager - Sensor Systems, Applied Signal Technology, Inc.

2:30

Leak Detection and Monitoring of Subsea Structures Daniel Esser, President, CONTROS Systems & Solutions GmbH

3:00

Break

Tools of the Trade

4:00 Inertial Navigation Systems for Subsea Survey—Expensive, Rocket Science, Difficult to Export —So Why Do We Need Them? Keith Vickery, President, Zupt, LLC

4:30

High-Resolution Scanning Surveys for Offshore and Nearshore Oil and Gas Facilities: Site Scouting, Construction, Monitoring and Decommissioning, Todd Mitchell, Fugro/Toby Lee, John Chance Land Surveys

5:00

Mapping Gas Hydrate Deposits in Deepwater Sediments Using DC Resistivity Techniques, Dr. John A. Dunbar, Baylor University

Panel Session—Thursday November 11th

9:00

Panel Theme

The Underwater Vehicle 2020

A futuristic look at IRM operations in the ultra-deepwater oilfield

Panel Moderator: Drew Michel

Guest Panelist: Graham Hawkes

The panel will address among other things:

What new breed of deepwater ROV or AUV is emerging to service the subsea industry over the next decade. Will it reside on the seabed? What power sources will be possible? What new subsea tools and techniques will they need to perform work?...and much more.

The panel will consist of vehicle and tool developers who are looking ahead at the requirements for vehicles to perform work in deepwater subsea fields. The panel will allow the operators, manufacturers and technologists to access what capabilities may be available in the future.

Invited panelists include representatives from Schilling Robotics, Lockheed Martin, SMD, Saab Seaeye, Perry Slingsby, Seanic Ocean Systems, Oceaneering, Subsea 7, Wachs Subsea, DOF Subsea, Cybernetix, Kongsberg, Marport Canada, and others.

12:00

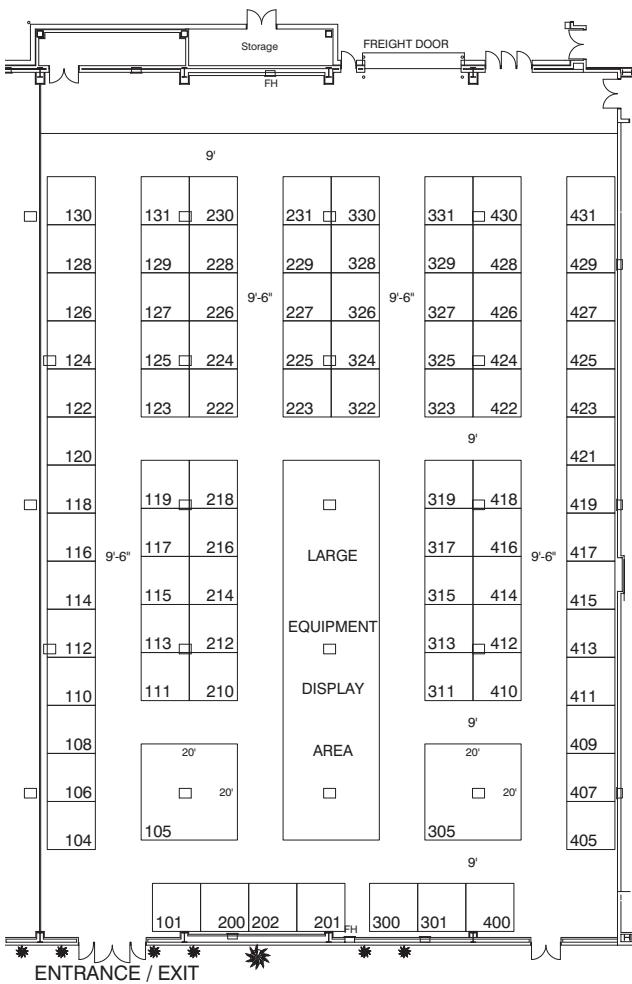
Conference Ends

List of Exhibitors (at press time)

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412	ASHTEAD TECHNOLOGY RENTALS	313	ROTECH SUBSEA
218	ATLAS MARIDAN	111	SAAB SEAEDGE
305	BLUEFIN ROBOTICS, INC.	417	SEA-TECH SERVICES
410	C&C TECHNOLOGIES	311	SEACON BRANTNER
105/107	CSA INTERNATIONAL, INC.	322/324	SMD
421	CSnet INTERNATIONAL, INC.	323	SOUND METRICS CORP.
422	EGS AMERICAS	104/106	SUBMERSIBLE SYSTEMS, INC.
305	EIVA A/S, Marine Survey Solutions	416/418	SUBSEA TECHNOLOGIES
101	GEOSPACE OFFSHORE	407	SUT HOUSTON
305	HARVEY-LYNCH, INC.	111	SYMPHOTIC TII CORP., INC.
212	HAWKES REMOTES, INC.	409	T. BAKER SMITH, INC.
416/418	HEMISPHERE GPS	112	TD WILLIAMSON
114	IMAGENEX	423/425	TECHNOLOGY SYSTEMS CORP.
417	KYMAR SUBSEA	113	TELEDYNE GAVIA
225	LABARGE, INC.	405	TELEDYNE IMPULSE
319	LOCKHEED MARTIN CORP.	405	TELEDYNE MARINE
131	MARPOT CANADA	405	TELEDYNE ODOM HYDROGRAPHICS
305	MCS OIL, INC., Turnkey Digital Video Solutions	413	THSOA
108	NCS SURVEY LTD	416/418	TRITECH INTERNATIONAL
414	NEPTUNE UNDERWATER SERVICES, (USA) LLC	123	ULO SYSTEMS LLC
205/207	OCEAN SPECIALISTS INC.	210	UTECH SURVEY INC.
223	OCEANEERING INTERNATIONAL INC.	417	VIDEORAY
200	OILCAREERS.COM	110	VISUALSOFT
411	PARKER HANNIFIN CORP.	119	WACH'S SUBSEA
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Presenter	\$350	\$350	
Exhibits Only/1-Day	\$15	\$15	\$15

EXHIBIT SPACE

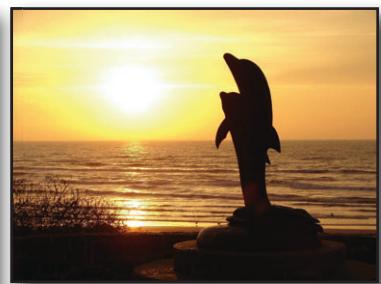
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New SMD Fall Pipe ROV Delivered

SMD has completed an exciting project to deliver what is believed to be the world's most powerful and deepest Fall Pipe ROV to Jan de Nul (JdN) of Belgium. The ROV was installed on JdN's vessel the Simon Stevin. The 191 m long vessel, with a loading capacity of 33,500 te, will be able to dump 2,000 te of rock per hour at a depth of 2,000 m. The ROV operates at the lower end of the fall pipe to accurately correct its position, so that it can place the rock very precisely. The rock is typically used to protect and stabilize pipelines and structures on the seafloor.

The vessel is JdN's first entry into the deepwater rock dumping market and enables them to offer their clients a "single contractor concept". SMD were very pleased to be chosen as their supplier and partner, to deliver the subsea remote intervention part of the system. The specification developed between JdN and SMD meets the core needs of higher power, reliability and precision control.

The design of the ROV draws heavily on SMD's experience in building high-power subsea remote trenching machines. The chassis and pipe are constructed in high strength steel, as used in our ploughs and trenchers. Six enormous Curvetech™ HT750 thrusters combine to generate over 6 te of thrust to position the pipe. They are powered by two Curvetech™ 400 hp power packs that are typically used on SMD trenching ROVs. The fall pipe exit is fitted with a deflector which can be rotated to accurately position the orientation of the exiting rock.

The precise control of the ROV is achieved through SMD's Distributed Vehicle Control System (DVECS) coupled with our ROV DP (dynamic positioning) system as used on our work class ROVs. The ergonomic topside control system and automated features of the ROV DP system greatly enhance productivity by



reducing pilot error and increasing predictability of operations.

The complete system was put through its paces during extended wet testing. The system was then installed and commissioned on the Simon Stevin under SMD's supervision.

The system will also be supported offshore by an SMD Quasar Workclass ROV system that was delivered simultaneously. This is SMD's mid-sized construction class system which will primarily be used for deepwater survey and other tasks.

For more information, contact Ian Griffiths at ian.griffiths@smd-us.com.

DOF Subsea adds Schilling Robotics UHD™ systems to ROV fleet

Schilling Robotics, LLC, experts in subsea systems, announced today the order for two new 200 hp UHD™ ROV systems from specialist subsea service company DOF Subsea. In addition, two original UHDs delivered to DOF Subsea in 2006 will be upgraded to the advanced UHD Gen II design, providing enhanced capabilities and performance. Deliveries of the 4,000 meter rated UHDs are scheduled to commence in the fourth quarter of 2010.

This order reflects a continued commitment between DOF Subsea and Schilling Robotics for the supply of advanced, high-performance, ultra-heavy-duty, work-class ROV systems. The UHDs feature Schilling's unique power management system, remote diagnostics, and advanced automatic piloting modes that deliver superior operational stability and precise control. Based on integrated sub-systems, the UHD reduces complexity, increases efficiency, and lowers the cost of owning and operating an ROV from day one.

The exceptional performance of the UHDs, paired with Schilling's ability to provide comprehensive customer support in all of the major offshore oil and gas regions of



the world, will help enable DOF Subsea's growth in international markets. "We are very pleased that DOF Subsea has once again selected Schilling UHDs to expand their fleet. Our ongoing commitment to providing the most reliable ROV systems, coupled with industry leading global support, are core philosophies that ensure our customers' success," says Tyler Schilling, chief executive officer for Schilling Robotics.

For more information, visit www.schilling.com.

Underwater Intervention

Hawkes Remotes Inc. unveils new class of ROVs

Hawkes Remotes Inc. (HRI) has announced its initial product lineup, a family of three different ROVs that incorporates new proprietary fiber-optic tether technology and high energy-density batteries to enable range, depth, and deployment capabilities well beyond those of current-generation ROVs.

HRI's ROVs will leverage the company's newly developed SpiderOptic™ technology, which utilizes thin armored fiber-optic tethers that pay out as the vehicles move, reducing drag, improving performance, and eliminating the need for cumbersome ship-based support infrastructure. HRI's SpiderOptic cartridge systems will be available in single-use (disposable) and reusable configurations, and are designed to be easily and quickly swappable in the field. In addition, all HRI vehicles will be made available for full ocean depth, building on a suite of tested components developed for the Challenger-manned deep sea submersible.

"SpiderOptic technology fundamentally changes the way ROVs move through the water," said Graham Hawkes, the company's chief technology officer and co-founder. "By using thin tethers deployed directly from the vehicle, we will fundamentally alter the performance and efficiency of deep sea and long range deployments. This technology also gives HRI's ROVs a decided advantage in portability, enabling rapid response deployments and utilization from smaller ships of opportunity."

"When you look at the cost of ROV operations, it's driven primarily by the ship costs, not the actual ROV cost," added Jonathan Epstein, the company's chief executive officer and co-founder. "Moreover, the capital cost for standard ROVs capable of deepwater work requires expensive TMS and deck gear. For a large percentage of subsea tasks, HRI's vehicles enable those costs to be eliminated or reduced by 80%, which will improve the economics for existing subsea businesses, while enabling new subsea applications and increasing the potential scale of ocean exploration by the world's research community."

Three ROV Models Optimized for Specific Applications

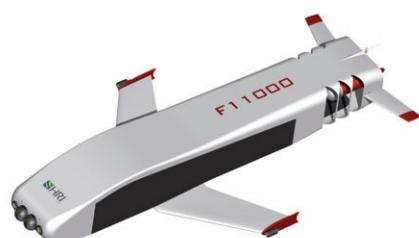
HRI is currently developing three different ROV models for launch in 2011. The Company's first vehicle, the U-11000, is scheduled for release in Q1 2011 and will be optimized for long-range sur-



vey, observation, and light intervention, making it ideal for remote inspection, repair and maintenance work (IRM) in commercial subsea environments as well as for a range of oceanographic applications. The U-11000 will have a range as long as 20 km from its launch point, allowing it to be deployed for certain tasks from shore or from an ocean platform instead of from a ship, further reducing cost of operations as compared to current ROV systems.



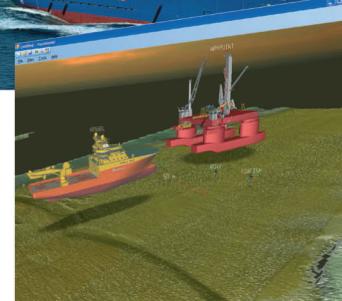
HRI's next two ROVs will be launched in the second half of 2011 and will include the T-6500, designed for a broad range of tasks below the launch point, and the F-11000, a hybrid AUV/ROV model with up to 6 knots forward thrust and a large payload for sensory and survey equipment.



For more information, visit www.hawkesremotes.com.

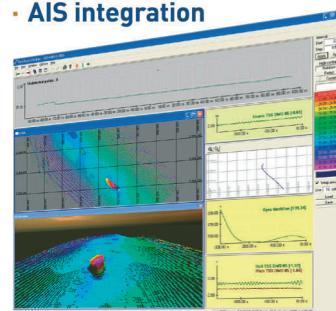
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Photo courtesy of DOF Subsea



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Underwater Intervention

T.D. Williamson, Inc. unveils new 48-inch Gas Magnetic Flux Leakage Inspection Tool



T.D. Williamson, Inc. (TDW) has announced the successful development of a new 48-inch Gas Magnetic Flux Leakage (GMFL) inspection tool, recently engineered at the TDW facility in Salt Lake City.

The new tool, which has already had a field run on a 48-inch natural gas transmission line in Canada, reveals the sheer versatility of the services that TDW offers to its pipeline customers. TDW can provide cleaning pigs and inline inspection (ILI) services using its 48-inch Kaliper®360 tool for identifying physical anomalies and geometry in a pipeline and using its 48-inch GMFL tool for identifying corrosion features and pipe wall loss. TDW can also offer hot tapping and plugging services to assist with the repair of identified anomalies.

TDW's GMFL tool is uniquely designed to fill a niche in the ILI market. Gas pipeline MFL tools do not enjoy the advantages that liquid product MFL tools do. In a liquid line, the product (for instance, crude oil) provides lubrication, reducing friction between the inspection tool and pipe wall. This makes it possible to maintain a steady speed as the MFL tool traverses the pipe. In a gas environment, however, opposite conditions predominate: without the lubrication, friction rises, causing the magnetic inspection tool to "stick" to the pipe wall. In addition, it is difficult to maintain a steady tool speed because variations in gas pressure cause the tool to stall and surge as it moves within the line.

The TDW high resolution GMFL tool addresses these impediments with three strategies. First, each magnetizer "floats" individually so that magnetic forces are consistent whether in a thick or thin wall or a tight bend. By reducing tool drag, floating magnetizers enable more consistent velocities. Second, the traditional MFL tool has coarse steel brushes that magnetize the pipe

wall (so that sensors can read magnetic loss levels). These are replaced in a GMFL tool with smooth, flat wear skid plates that glide more easily. Finally, the tool's design allows for as much as 25% bore reduction and is constructed of lighter weight materials, making the TDW GMFL tool approximately half the weight of other 48-inch tools. All this means that the GMFL tool offers a greater ability to negotiate breadth reductions which, along with reduced tool drag, allows for more consistent velocities and, therefore, more accurate inspection.

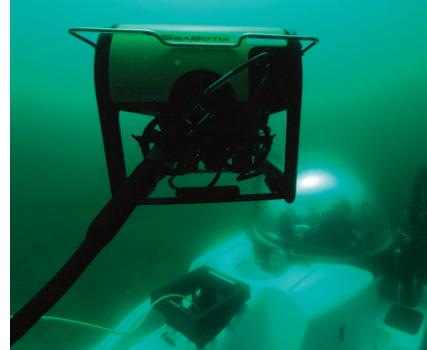
An additional feature of TDW's ILI services is the ability to remove foreign liquid from a gas pipeline. Over time, liquid (for instance, glycol) is sometimes introduced into the line and is not adequately removed. This then collects in pools of liquid at low levels. These pools reduce the throughput of the line to below its optimum capacity, rather like a blockage in the drain of a sink. TDW's Pigging Products Division (PPD) has addressed this problem by providing custom engineered cleaning pigs with special urethane cups and discs designed to "shoot out" liquid settled in the pipe.

The 48-inch GMFL tool is the largest ever developed by TDW; previously, the maximum size offered was 42 inches. "The interest already shown in this tool indicates that there was a significant gap in the ILI market that we have been able to fill," said Soanes. "We are certain that there are busy times ahead for our new 48-inch GMFL tool," he added.

SeaBotix HD LBV300 for deployment from the Deep-C submersible

SeaBotix recently teamed with SEAmagine Hydrospace Corporation, manufacturers of one-atmosphere submersibles, to create a truly unique and revolutionary system for client Mike Caplehorn. The Deep-C, number 9 in SEAmagine's lineup, is its newest 2-man Ocean Pearl model that is ABS Classed and rated to a depth of 320m. SeaBotix worked closely with SEAmagine engineering including President Will Kohnen to integrate its 320m-rated LBV300 HD including a purpose-built Tether Management System (TMS) with ROV garage and a tractor drive to deploy and retrieve the LBV.

One special feature, a SeaBotix Guillotine Cutter, was added at the drum. Since the primary use for the LBV is to film in and around shipwrecks, the ability to cut the LBV tether should Deep-C be irreversibly entangled was critical to achieve ABS Class for the submersible.



The emergency system requires three active operations to function.

The LBV300 HD is the first miniROV with a truly-integrated high-definition 1080i video system. Employing a Sony block camera installed within the camera enclosure, it has the same 180-degree tilting capability as the standard cameras. The video feed is via SeaBotix' 8 mm fiber-optic tether with 100 Kg working load. By building the system into the LBV Camera Enclosure without changing the vehicle profile, HD LBVs can also carry and simultaneously run other large sensors on a lower Tool Skid. The hydrodynamic efficiency and payload capability is the same as standard LBVs. In the case of Deep-C's LBV300 HD, this allowed space to mount both a universal 3-Jaw Grabber and another powerful Guillotine Cutter for dual manipulator functionality.

This capability was critical, as the secondary function of the LBV is to help free Deep-C from entanglement should it be caught in kelp, abandoned nets, and other detritus. Deep-C performed 42 hours of diving through 23 dives in conditions ranging from the shallow sandy bottom for LBV training to large kelp fields and 300 m deep ledges under strong wind, surge, and current conditions.

It is believed that Deep-C is now the smallest one-atmosphere manned-submersible on record to deploy an ROV. SeaBotix is proud to be part of this accomplishment and to have supplied the world's first truly-integrated HD video system in the miniROV class and smaller.

For more information, visit www.seabotix.com

Bluefin-9 AUV completes world tour—Bluefin and Florida Atlantic University enter into an agreement

Bluefin Robotics, an Autonomous Underwater Vehicle (AUV) manufacturer is pleased to announce the Bluefin-9 AUV has successfully completed a series of consecutive demonstrations. The air-shipable, two-man portable AUV system journeyed through the U.S., Australia, France and Japan before diving into UK waters this August.

The most recent demonstration conducted at the facilities of Bluefin's representative in Portland UK, GMSL, represents the completion of a nearly two-year

world tour during which no major repair was required. Despite rough handling through repeated shipment, unpredictable weather conditions, and widely varying environments, the Bluefin-9 system consistently performed right out of the shipping container.

During the demonstrations, participants were impressed with the vehicle's reliability, ease-of-use, rapid turnaround time between missions, field-swappable rechargeable batteries, and superb imagery quality. The Bluefin-9 performed particularly well in ports and harbors where surfacing and magnetic interference are typical AUV concerns; the system's navigation accuracy and unique employment enabled this achievement. The AUV was often mobilized and deployed in less than one hour typically as a result of the reliability of the system and the minimal equipment required for operation. No beacons or buoys are needed for navigation, which further reduces time and cost.

The Bluefin-9 logged hundreds of kilometers of mission distance during the course of the demonstrations. Equipped with a side scan sonar, CT probe, depth sensor, turbidity sensor, and camera, the system demonstrated amazing versatility in surveying siltation in rivers in Japan; pipelines and a wind farm site in the English Channel; the ports of Brest; France and Sydney, Australia; harbor floors and bridge pilings in San Diego; and an LNG terminal in Louisiana. All of this was accomplished with only minor field repairs and adjustments made possible by the systems modular architecture. This design approach also allows for maintainability in the field, maximizing run time, making the platform ideal for global operations.

In addition, Bluefin Robotics announced a Memorandum of Agreement with Florida Atlantic University (FAU) that establishes a framework that promotes the development of a Glider Research and Operations Center (GROC) at FAU's Harbor Branch Oceanographic Institute (HBOI). The purpose of the agreement is to collaboratively further glider-based marine science and technology research in the areas of education, autonomous vehicle development, manufacturing, and at-sea operations. Ultimately, the team aims to create an extended field presence with the Bluefin Spray Glider, particularly in the Gulf of Mexico and southeast Atlantic regions for persistent environmental monitoring.

For more information, visit www.bluefinrobotics.com.

Oceans's 2010 Conference Review

The Marine Technology Society (MTS) and the Oceanic Engineering Society of the Institute of Electrical and Electronic Engineers (IEEE/OES), two organizations focused on the marine industry, welcomed more than 1,800 attendees from around the world to the Oceans '10 MTS/IEEE Conference & Exhibition, September 20 to 23, 2010, Seattle, Washington, USA.

"We are pleased that attendees realized great success and positive experiences through the Organizing Committee's dedicated conference planning," said Ted Brockett, Conference Co-Chair, Oceans '10 MTS/IEEE Seattle Local Organizing Committee. "With a large and lively exhibition, cutting-edge technical sessions and outstanding plenary speakers, this year's event was stronger than ever."

Oceans '10 MTS/IEEE plenary speakers included Nii Allotey Odunton, Secretary-General, International Seabed Authority; Liu Feng, Deputy Director-General, China Ocean Mineral Resources R&D Association; and Yoshio Isozaki, Director-General, Japan Agency for Marine-Earth Science and Technology.

Attendees also had the opportunity to visit with 159 exhibitors from the U.S., Canada, Netherlands, South Africa, UK (England and Scotland), Norway, and Russia.

Each year, MTS and IEEE/OES present awards to extraordinary individuals, companies, or groups. This year's MTS award recipients include:

- 2010 Fellows: Karin Lynn, Julius Rockwell
- Compass Distinguished Achievement Award: Julius Rockwell
- Compass International Award: Simon Allen
- Compass Industrial Award: Schilling Robotics
- Lockheed Martin Award for Ocean Science and Engineering: Chuck Richards
- Ocean News & Technology Young Professional Award: Stephen Faleye, Marcel Montrose

This year's IEEE/OES award recipients include:

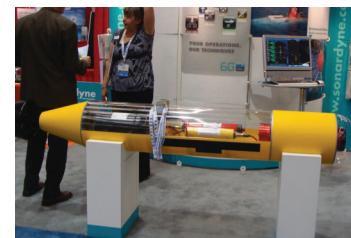
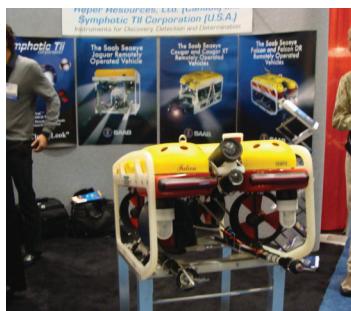
- Distinguished Service Award: Thomas Freud Wiener
- Distinguished Technical Achievement Award: Tamaki Ura
- President's Awards: Dr. Rene Garello, Dr. Christian de Moustier, Stephen M. Holt, and Dr. Christoph Waldman



MTS Fellow and Publisher Dan White (far right) presents the first Ocean News & Technology/MTS Young Professional Award to recipients Marcel Montrose (left) and Stephen Faleye (right). Each award included a plaque and check for \$1,000. Every year at the MTS/IEEE Oceans Conference, Ocean News & Technology magazine will recognize two individuals aged 35 years or younger who demonstrate excellence in their careers and who have made valuable contributions in leadership positions at MTS.

EXHIBIT HALL HIGHLIGHTS





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the vehicle and confirm the location of the casualty."*



*Without the LYYN this
task would have been
near impossible and time
consuming. The LYYN is a
critical element of the SARbot
system."*

*Duncan Winsbury,
Derbyshire Fire & Rescue*

Read this case on
www.lynn.com/derbyshire

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New BIRNS Millennium™ Standard Hybrid Electro-Optical Connectors

BIRNS, Inc., global leader in the design and manufacturing of high performance connectors, penetrators, custom cable assemblies, and lights for the subsea technology market, now offers two standard hybrid pin configurations for electro-optical hybrid connectors: the BIRNS Millennium™ 3T and 3O. The versatile new options in the acclaimed BIRNS Millennium connector series provide high performance, technologically advanced solutions to deliver maximum data and power for extreme depth applications.

The BIRNS Millennium 3T can handle both high voltage ($\leq 3.6\text{Kv}$) and low voltage ($\leq 600\text{v}$) conductors — users can specify a wide range of configurations with up to 31 electrical wires and up to 10 optical fibers. The BIRNS Millennium 3O has a single optical fiber, with the capability of handling up to 10 electrical wires. Both unique standard hybrids are available in single or multi-mode and provide incredibly low data loss — typical loss recorded for a cable assembly of the series is $<1\text{dB}$, in accordance with ANSI/TIA/EIA-455 for fiber optic return loss test procedures.

"In the last decade, BIRNS has been leading the industry with electrical, fiber optic and hybrid connector innovations. Creating a standard hybrid series is the next logical evolution of the way we continue to shape this new technology," says Eric Birns, President and CEO. "By offering these two standard solutions that can be customized to fit a wide range of pin configurations, we can provide versatility and performance, along with short lead times, that are unparalleled in the industry — and perfect for the majority of our customers' specific needs."

Like all members of the BIRNS Millennium series, the new standard hybrid options are tested to withstand high open face pressure and are rated to 6,000 m. They provide elevated contact density with 50 microns of hard gold contact plating, and have standard exclusive BIRNS features like dual self-guiding stainless steel keys and keyways for



BIRNS Millennium 3T (above) and Millennium 3O (right)

positive indexing. Plus, they are engineered with a 15-degree molded internal o-ring lead-in chamfer specially angled to ensure the dual o-rings' longevity and reliability. Each insert's solder pots are scalloped and face out from center for ease of wiring access. Additionally, the series' solder pots are insulated with GRE part way up the shaft and, after termination, heat shrink tubing is placed over the entire conductive area for a completely insulated termination, which prevents electrical interference between pins.

The new BIRNS Millennium standard hybrid electro-optical hybrid series can be made with special mounting configurations that can be designed to conform to MIL-C-24217/4-005 specs to provide a seamless upgrade option for legacy equipment. For creating complete cable assembly systems, all of BIRNS' expert electrical technicians are Certified IPC Specialists per J-STD-001 and BIRNS' optical technicians are ETA-I certified.

For more information, visit www.birns.com.



High Performance Impeller Pumps



When boat owners are in need of flexible impeller pumps, there's one name they can always trust, JMP. The company's electro-magnetic clutch, general multi-purpose and engine cooling pumps can be designed to meet specific application requirements.

For over 30 years, JMP has manufactured pumps and currently has over 50 basic models. When a precise engine cooling application is needed, the company can develop a solution.

JMP's flexible impeller pumps feature a strong bronze body and mechanical seal for a long life. They are sealed at the endcover, or impeller cover, instead of at the gasket. JMP's pumps come with a high-performance and durable flexible impeller.

The company's electro-magnetic pumps can be used in high-capacity bilge or deck-wash and emergency fire-fighting situations. With flow rates from 26 gal/min to 156 gal/min at 1,800 rpm, the general, multi-purpose pumps can handle a wide range of liquid transfer, circulation, and processing.

For more information, visit www.jmpusa.com.

Sea-Bird launches moored MicroCAT CTD with integrated dissolved oxygen

Sea-Bird Electronics announces the release of the next generation of the field-proven MicroCAT. The MicroCAT-IDO adds Dissolved Oxygen (DO) to the MicroCAT Conductivity, Temperature, and Pressure sensor in a compact and economical package. The DO sensor is based on Sea-Bird's field-proven SBE 43, with the same performance specifications. Adaptive Pump Control calculates optimal pump time for maximum DO accuracy while minimizing power consumption for long endurance deployments. The expendable anti-foulant devices, unique flow path design, and pumping regimen maximize bio-fouling protection for the conductivity and dissolved oxygen sensor.

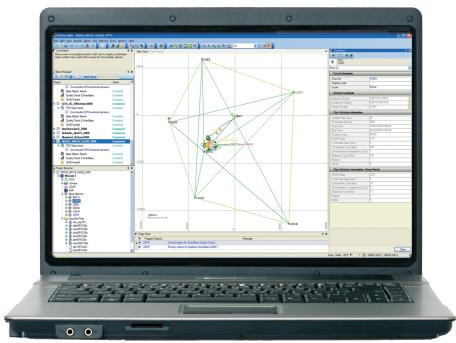
The MicroCAT-IDO is available with RS-232, RS-485, or Inductive Modem interface for depths to 250 meters (plastic housing) or 7,000 meters (titanium housing).

For more information, visit www.seabird.com/announce.htm.



Applanix introduces POSPac MMS 5.4 with IN-Fusion Precise Point Positioning technology

Applanix has announced a new version of its post-processing software for Mobile Mapping and Positioning, POSPac MMS version 5.4. Designed to enhance the productivity of Mobile Mapping, POSPac MMS 5.4 features an all-new Inertially-Aided Precise Point Positioning (IAPPP) engine and enhanced smoothing algorithm.



Precise Point Positioning (PPP) is an effective GNSS processing technique that uses precise clock and ephemeris information to converge to decimeter-level position accuracy without base stations or expensive commercial SBAS subscriptions. It is an ideal and cost-effective method of positioning for mobile surveys in remote areas or where centimeter-level accuracy is not required. Traditionally, PPP techniques suffer degradation in accuracy following any loss of GNSS signal, requiring significant time for the solution to re-converge. Applying the Applanix IN-Fusion™ techniques to PPP overcomes this by using inertial data to mitigate for signal outages and to retain full solution convergence.

POSPac MMS 5.4 also uses a new smoother algorithm for reverse time processing, greatly reducing or eliminating the position discontinuities associated with satellite constellation or fixed ambiguity changes. This is ideal for applications such as high-resolution mobile laser scanning that measure thousands of points per second.

POSPac MMS version 5.4 is available through the Applanix sales network and to all POSPac users currently under a maintenance contract.

For more information, visit: www.applanix.com.



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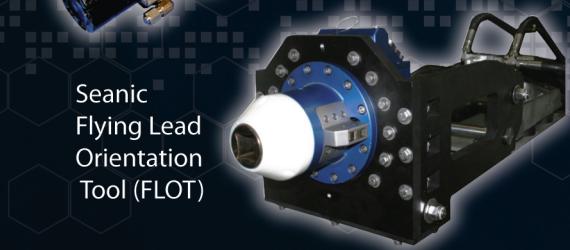
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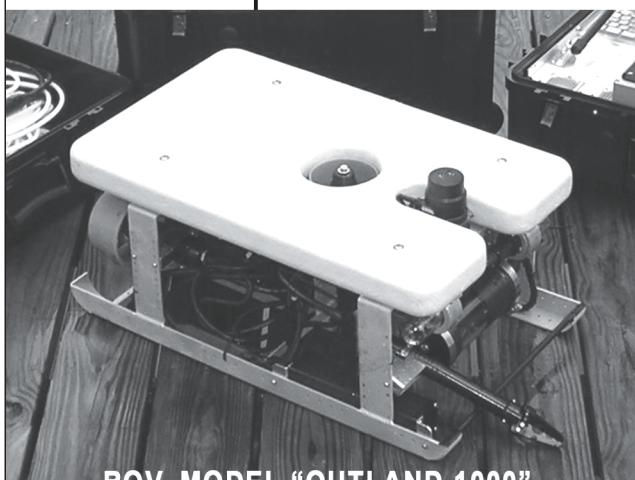
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Product News

FURUNO launches NavSkills™ training concept



FURUNO has launched a new and groundbreaking training concept and simulator solution called NavSkills™.

"This is different from all known provisions of maritime training simulators and solutions today in the maritime industry," says Mads Friis Sorensen, branch manager of FURUNO European branch office in Copenhagen. "The NavSkills™ training solution is the expressway for ship owners and training centers to be capable of providing DNV SeaSkill™-certified ECDIS and IBS/INS training courses to the navigators. The NavSkills™ solution consists of a full mission training simulator with ECDIS planning stations. To make the training environment more realistic, FURUNO uses real equipment in the provided bridge system and at the planning stations. The simulator will be approved by DNV SeaSkill™ as class A or S, depending on the solution selected by the ship owners/training centers."

"The uniqueness of the NavSkills™ solution lies with the second part of the package, which is a service contract," Mads Friis Sorensen continues. "The service contract covers the provision of approved training materials, education of the local instructors, and the assessment by DNV SeaSkill™ of the training courses to be conducted by the NavSkills™ customers locally – it is a kind of turnkey solution, which enables the ship owners or training centers to provide DNV SeaSkill™-certified training courses from the day one." FURUNO will, as part of the service contract, handle the issuing of certificates to the trainees." In this manner, the training centre or owner can apply oneself to the effectiveness of training offered, and thereby utilize own resources in an optimal manner - FURUNO will be the guarantor for quality.

The training package includes DNV SeaSkill™-certified ECDIS training in accordance with IMO Model Course 1.27, DNV SeaSkill™-certified IBS/INS operator training course in compliance with IMO Model Course 1.32, Bridge/Engine Resource Management training and Bridge Team Management training.

In August 2010, FURUNO INS Training Center received — as the first training centre worldwide — the certification by DNV SeaSkill™ for the compliance of FURUNO's INS training course with the IBS/INS IMO Model Course 1.32.

Hadal Technologies releases Oculus high definition camera

Hadal Technologies Inc., has released its Oculus high definition camera. The Oculus HD camera is designed for straightforward integration on any fiber optic equipped subsea system. Oculus provides a broadcast video standard HDSI (High Definition Serial Digital Interface) signal over fiber optic cable directly from the camera, with no need for additional signal conversion. Requiring only power and serial control, the Oculus provides uncompressed 1080i video, 10x

optical zoom, and complete auto or manual camera control-all in a compact eight inch long, four inch diameter, 6,000 meter depth rated package.

HDSI over fiber resolves noise and interference issues that plague HD analog



component (YPbPr) signals and the impedance mismatch problems that HDSI signals over copper encounter when passing through standard subsea connectors. HDSI is full bandwidth, uncompressed video without the processing delays and multi-second loss-of-signal problems that are inherent to compressed video signals. Coupled with Hadal Technologies' Octopod HD Receiver/multiplexer, Oculus provides a simple and straightforward upgrade path for an entire ROV camera system, with up to eight cameras multiplexed onto a single fiber optic cable. Suitable for oil and gas inspection tasks, scientific exploration, and broadcast feature productions, Oculus cameras deliver exceptional high-quality video at an affordable price.

For more information, visit www.hadaltech.com.

New tool to help find pipelines and cables

Oil and utility companies have been laying pipelines under the ocean for more than a century. Before the introduction of GPS, marking their position was a difficult and tedious task, fraught with error. Over time, the position and burial depth of a pipeline was often changed due to storms and other environmental forces. Today, there is a pressing need to accurately map the location of these lines to ensure they are not damaged by dredging, dropped anchors, and other potentially hazardous operations. With a large number of these pipelines decades old, there is also an urgent need to examine their condition and perform a thorough inspection. The problem is, many can not easily be located.

To assist in the effort, JW Fishers has developed the PT-1 pipe tracker. This instrument is a very sensitive pinpointing



magnetometer. It works equally well on land and underwater. The PT-1 was specially designed to locate and track iron and steel pipelines, but will also detect any ferrous (iron/steel) object that comes within its detection field. The range of the instrument is not affected by the material between the sensor and the metal target. The range remains the same whether detecting through air, water, silt, sand, stone, or concrete.

The PT-1 uses modified magnetometer technology to provide exceptional sensitivity with effortless pinpointing of targets. The device can easily locate and track pipelines within close proximity of bridges, metal bulkheads, and steel reinforced piers, which would be difficult, if not impossible, with other magnetometers. An additional advantage is the pipe tracker's directional capability; the ability to determine in which direction the target is located and quickly pinpoint its exact position.

Fishers pipe tracker consists of a 3 foot long probe with electronics box mounted on one end. In the tip of the probe is a sensor that measures the earth's magnetic field strength. Iron and steel objects create a distortion in the field that the sensor picks up. Field changes are displayed on the PT-1 control panel with both audio and visual outputs. The larger the object, the stronger the reading will be. The visual indicator is an LED light bar that illuminates more lamps for stronger signals. The audio output is heard through a waterproof earphone and increases in frequency as the target gets closer. The pipe tracker's rechargeable battery pack powers the system for 15 continuous hours.

Other groups that will find this device invaluable include police departments and military dive teams for locating weapons, mines, and other explosive devices. Commercial diving companies can use it to track armored power and communications cables, find anchors and chains,

locate lost dredge heads, and recover tools. Professional treasure hunters will be impressed with its ability to pinpoint the ferrous metal objects marking a shipwreck site, such as cannon, cannon balls, and old iron anchors.

The PT-1 comes complete and ready to operate. Included accessories are AC and DC battery chargers, an underwater earphone, and land headphones. The instrument is depth rated to 200 feet and is covered by Fishers unconditional two year warranty.

For a data sheet on the pipe tracker or more information on JW Fishers complete line of underwater search equipment, visit www.jwfishers.com.

L-3 Klein System 3900 Locates Cessna 414 in Nova Scotia

L-3 Klein Associates, Inc. announced today that its System 3900 dual-frequency side scan sonar system was successfully used by Halifax-based Wreck Hunter Incorporated to locate a Cessna 414 airplane off the coast of Nova Scotia. The L-3 Klein sonar system is an extremely high-resolution digital sonar for use in search and recovery missions that require a portable side scan sonar capability.

The System 3900 is designed to support dual frequencies, with a 445 kHz frequency that offers excellent range and resolution and a 900 kHz frequency that offers higher resolution of identified targets. Wreck Hunter sonar operators used the low 445 kHz frequency to cover a swath of area 150 meters wide to locate the aircraft's fuselage, which was identified in 52 meters of water 11 kilometers off Glace Bay, Nova Scotia.

"Both the Royal Canadian Mounted Police (RCMP) and on-site Transport Canada officials were very impressed with the quality of the images from the Klein System 3900 as well as its portability and ease of operation," said Terry Dwyer, operations manager for Wreck Hunter

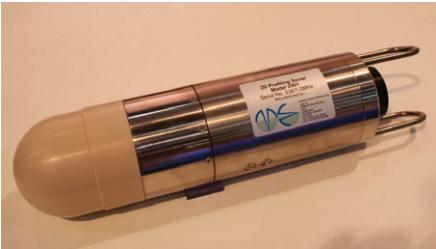
Incorporated. "In less than one hour, the system was set up onboard the RCMP Patrol Vessel Preventer, and we were fully operational to survey the targeted search area."

"The ability to quickly mobilize and deploy equipment and to locate and identify critical assets and items of interest underwater was one of the main drivers in developing and bringing to market our System 3900 for search and recovery," said John Cotumaccio, president and general manager of L-3 Klein. "This is another example of how the system's superior underwater imaging capability and ease of use have made the product such a success."

L-3 Klein, a division of L-3 Marine & Power Systems, is located in Salem, NH, and is a leading sensor technology provider that manufactures and designs high-resolution sonar systems, marine navigation systems, and radar-based security and surveillance systems. With over 40 years of experience, Klein's customers include commercial, government, and military organizations; shipping and offshore oil companies and related support contractors; maritime facilities; academic institutions; and underwater vehicle manufacturers. To learn more, please visit the company's website at www.L-3com.com/Klein.

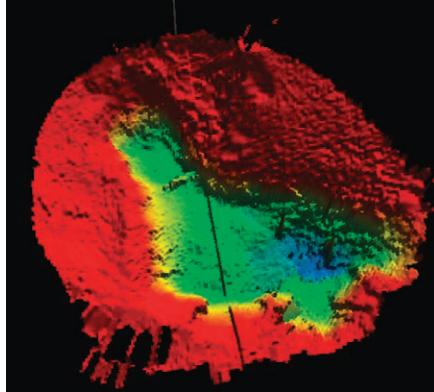
Salvage divers use Marine Electronics' 2001 3D sonar to monitor progress

Divers working for sub-sea services company Fathoms Ltd have confirmed the



benefits of 3D sonar when working in water with poor or zero visibility. The team has been excavating the seabed at a wreck in European waters where the divers have been forced to rely upon instinct and touch to find their way around the site. Despite these difficulties, the divers have been able to work effectively by employing a 2001 3D sonar from Marine Electronics Ltd (MEL) to scan the site before each session.

The eight-man dive team has been steadily removing the overburden of mud with an air-lift, and their work is clearly visible on the MEL sonar images. These reveal the contours of the excavated hole



in considerable detail and enable the divers to preserve a mental picture of the site before they descend to resume work.

Working at a depth of 24 meters, the dive team has excavated a hole some 20-meters in diameter and eight-meters deep. By referring to the images from the MEL 2001 sonar, it has proved possible to work very efficiently and concentrate on specific areas that required attention. Work is due to resume on the project soon after a break of several months. The team expects to find that considerable in-filling of the hole has occurred and the MEL 2001 will help with its removal before excavation can resume.

Project manager Matthew French explained: "We chose the MEL sonar because we thought it would be the one that gave the best result. In practice, it made the divers' lives much easier by being able to understand the shape and size of the hole they were creating."

The MEL 3D Profiling Sonar System makes it possible to capture short-range 3D bathymetry data at high resolution. The underwater sonar head was lowered on a pole to depths of around 5 to 6 meters from where the acoustic transducer would scan a horizontal swath. It would then be rotated by a small angle and another swath captured until a complete circular area underneath the sonar dome is covered, in an operation that takes just 10 minutes.

The model MEL 2001 is available in either a cable-connected or self-contained logging version. The sonar may be fitted with optional conductivity, temperature, pressure, pitch, and roll sensors. With the full complement of sensors the logging unit can process raw data to arrive at an ASCII "XYZ" file directly. The logging version has an internal Ethernet link that can be used to upload the stored data without opening the pressure housing.

For more information, contact Brian Evans at +44 (0)1481 253181 or sales@marine-electronics.co.uk.

Increasing diver safety with new emergency locator beacon

Mobilarm Limited, the company behind the innovative V100 locator beacon, has announced a leap forward in the

development of its proprietary marine safety technology, resulting in a new application of its VHF locator beacon technology for commercial, sports, and professional divers around the world.

The leading global marine safety technology specialist will release a small, lightweight locator beacon for divers, based on the cutting-edge defense submarine escape and abandonment emergency locator beacon, the Mobilarm V200, which was designed under contract with the U.S. Navy for submariner emergency escape use.

The new dive locator beacon is up to 50 percent smaller and lighter in comparison to the existing submariner beacon, making it perfectly suited for professional and recreational divers. The new dive locator beacon, which Mobilarm expects to ship mid-2011, enables above-water GPS location and automatic distress alerting over VHF radio should divers find themselves stranded from their boat.

The Mobilarm V100 VHF locator bea-



con, from which the new submariner and dive versions are derived, is a versatile Maritime Survivor Locating Device. The pocket-sized unit is attached to clothing or integrated into lifejackets and will automatically activate when the wearer has gone overboard, sending out a Mayday message and real-time GPS coordinates of the casualty's current position via VHF Voice and DSC. In independent trials, Mobilarm's VHF beacons have outperformed existing technology with their ability to help rescue teams locate and track people in the water and plan their rescue more effectively.

For more information, visit www.mobilarm.com.

Sonardyne to provide positioning for North Sea pipe bundles

Sonardyne International has been awarded a contract by Subsea 7, one of the world's leading subsea engineering and construction companies, to provide its latest Sixth Generation® (6G®) acoustic technology for monitoring the position and status of towed offshore pipeline bundle systems. The bundles are manufactured at Subsea 7's facility in Wick, Scotland and towed to their final location in the North Sea suspended between two tugs; a technique known as Controlled Depth Tow Methodology (CDTM). Under the terms of the new contract, the first tow will take place in the first quarter of 2011 when a 7 km bundle will be towed out to the Bacchus field for Apache North Sea Limited. Later in 2011, four 7 km bundles will be towed to BP's Andrew field in the North Sea.

The Sonardyne 6G® acoustic equipment installed on each bundle will provide the towmaster with real-time information on the pipeline's position, depth, and shape along its entire length. These data will help ensure that the bundle is not allowed to sag or snake excessively during the tow due to the effects of tow speed, tide, and sea state and that it is "flying" at the required depth to avoid submerged objects. Should corrective action be required, the towmaster is able to alter the depth profile of the pipeline bundle by various methods, including varying the tow speed.

Sonardyne has considerable experience of this application for its acoustic technology, having first developed bundle monitoring equipment for Subsea 7 in 1993. At that time, depth monitoring transponders deployed at regular intervals along the bundle were



connected via data highway cable, to master units located on the tow head. These sent data acoustically to the towmaster and received commands back, such as to open the valves that controlled flooding of the bundles. The technology proved very effective, as any damage sustained to a bundle during tow-out is extremely costly to rectify.

For the latest tows, Sonardyne's new Compatt 6 transponders will be deployed at intervals of around 700 to 1,000 meters along each bundle. Sonardyne Lodestar attitude and heading reference sensors will also be deployed at each end of the bundles and at specified intervals along them. Lodestars contain highly accurate ring laser gyros that will enable the shape and attitude

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Fishers Pulse 6X and 8X detectors detect all metals, on land and underwater. Their Diver Mag 1 is a super sensitive detector for iron/steel targets and works equally well above and below water. All are built for commercial operations and have both audio and visual readouts.

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of the bundle to be monitored. The pressure of the carrier gas (nitrogen) within the pipes will be monitored by sensors at each end of the bundle, and this data, along with the angle of the towing wires, will also be transmitted.

Compatt 6 uses Sonardyne Wideband® 2 ultra-wide bandwidth signals that make it more versatile than previous versions. They can operate in more demanding acoustic conditions and are suitable for a wider range of applications than a conventional seabed positioning transponder. Acting as an acoustic network, each Compatt 6 will be able to transmit its data along the bundle to other transponders and onward to a transceiver in a towfish that will be flown from an escorting ROV Support Vessel (RSV).

The RSV will patrol the bundle going no further than 500 meters away from it. Because the towfish will be flown below the disturbed water layers near the surface it will be able to obtain clear acoustic signals from the transponders, thereby maximizing the communications robustness of the system. Depth updates from all monitoring points will be received at the RSV every 30 seconds

while heading, carrier pressure, and trailing wire angle updates will be received at five-minute intervals. The 6G® acoustic technology will also make it possible to monitor the tow-wire tension, activate its release, and operate carrier flood and vent valves remotely, if required.

For more information, visit www.sonardyne.com.

Kongsberg gear selected for Alaska Region Research Vessel

Kongsberg Maritime will supply a sophisticated suite of acoustic systems, including multibeam and scientific echosounders, for the Alaska Region Research Vessel (ARRV), R/V Sikuliaq, which has been commissioned by owner, the National Science Foundation, and will be operated by the University of Alaska, Fairbanks.

R/V Sikuliaq will have an impressive array of sonar equipment, including several Kongsberg Maritime manufactured systems such as the EM 302 deepwater multibeam echo sounder, EM 710 shallow water multibeam echo sounder, TOPAS PS 18 parametric sub-bottom profiler, and the EK 60 scientific echo sounder. In addi-

tion, the new Kongsberg Seatex Seapath 320+ will be supplied as a vessel attitude, heading, and position reference for the scientific sonar suite.

The R/V Sikuliaq is currently under contract for detailed design and construction at the Marinette, Marine Corporation in Marinette Wisconsin, and will be home ported at the UAF Seward Marine Center.

R/V Sikuliaq will be 254 feet (77.4 m) long, capable of breaking through 2.5 feet of ice at a speed of 2 knots, and able to accommodate a total of 26 scientists for up to 45 days at sea. It is designed and built to American Bureau of Shipping polar class 5 (PC 5) standards, which will allow the ship and its crew to work safely for longer periods of time in a wide variety of Arctic waters. When completed, it will be one of the most technologically advanced research ships in the world, enabling a wide variety of oceanographic research to be conducted and then transmitted to virtually any academic institution on the planet.

For more information, visit www.kongsberg.com.

WinFrog remains navigation software of choice for OMM

Fugro Pelagos, Inc. has made further software sales to subsea cable specialist Offshore Marine Management's (OMM) survey services section. The company's WinFrog integrated navigation software, first released in 1994, remains their flagship product and is the software of choice for OMM who have now invested in four product licenses from the California-based company.

The WinFrog suite remains at the cutting edge of technology and is fully upgraded, developed, and supported by its experienced in-house software development group. OMM have used the WinFrog software system to service their renewables project awards since early 2009.

OMM typically use the software for subsea inspection, cable lay, cable lay support, and remedial activities, including jetting, diving, matressing, scour protection and prevention measures.

They have used WinFrog on all their projects for the past 12 months, including the recent Barrow and Burbo offshore wind farm scopes of work in the Irish Sea, UK and the Transpower HVAC cable installation in the German Bight sector of the North Sea. It will also be used on the German project for the associated survey, WROV, and trenching operations due to commence in August 2010.

For more information, visit www.fugro-pelagos.com.

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People & Company News

Ashtead Technology has appointed **Emphor FZCO**, a well established Dubai based technology solutions provider to represent the Offshore Division in the Middle East region. Emphor will provide Ashtead Technology's full equipment rental fleet, incorporating Positioning Equipment, ROV Sensors, Hydrographic and Geophysical Equipment and IRM and Diving Equipment to customers in the region. A calibration facility, technical workshop and support facilities (with 24 hour technical support) as well as a training centre will also be provided from the Emphor facilities.

Marine displays manufacturer Nauticomp has appointed industry veteran **Bob Chew** to direct sales in the U.S. for its product line. Previously employed by Interphase Technologies, Chew has more than 30 years of marine OEM and after-market sales and marketing experience. He will be headquartered at the Nauticomp U.S. sales office in Fort Lauderdale, Florida.

INTECSEA, a WorleyParsons Group company, names **Uri Nooteboom** president, succeeding Craig Reeves who is returning to a position within the WorleyParsons Group in Australia. Prior

to his appointment as president of INTECSEA, Nooteboom served as the company's senior vice president International Operations and was responsible for INTECSEA's North American and Brazilian businesses.

IOS InterMoor AS, an Acteon company, has been awarded a global mooring frame agreement by **Statoil Petroleum AS**. The three year contract for mooring services also has an option to extend the agreement for up to two periods of one year each. IOS InterMoor's scope of work includes providing high quality mooring equipment, personnel, and technical support for offshore operations to Statoil's rig fleet in Norway and internationally.

The **Oceanscience Group** has appointed **EMS Sistemas de Monitorizacion Medio Ambiental, S.L.** as exclusive representatives of the UnderwayCTD (UCTD™) and Underway Sound Velocity (USV) profilers in France and Spain. The UCTD™ and USV, revolutionary compact sensor deployment sys-



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tems that allow repeatable CTD and sound velocity casts while underway at over 10 kt, will complement the range of products and services offered by EMS in both the oceanographic research and hydrographic survey industries. Started by a group of oceanographic engineers, EMS was founded in 1995. Under the direction of Miguel Moll Kraft, EMS specializes in instrumentation, equipment and systems serving the oceanographic community and users of marine technology.

InterMoor, an Acteon company, has named **Joe Hebert** Operations Manager, Working out of InterMoor's new Morgan City, LA, facility, his responsibilities will include managing the operations department on a daily basis, interfacing with clients, and project management. Hebert has more than 20 years of oil and gas experience working at InterMoor.

Oceanscience, the design and manufacturing group for systems and deployment platforms for hydrographic, hydrologic, and oceanographic instrumentation,



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has recently appointed **Dr. Adrian McDonald** to oversee global sales and marketing efforts. McDonald joins the company with 12 years experience in the oil and gas industry. Based in San Diego, California, McDonald will focus on promoting the new UnderwayCTD and UnderwaySV, the revolutionary compact profiling systems that allow research-quality CTD and sound velocity profiles to be gathered from a moving vessel.

Adm. Thad W. Allen announced that after completing his service as national incident commander of the BP oil spill in the Gulf of Mexico, he will join the RAND Corporation as a senior fellow, effective October 4. Allen was scheduled to join RAND in May 2010, shortly after he retired as commandant of the U.S. Coast Guard. But his transition was delayed when he was asked by President Obama to manage the oil spill emergency response and clean-up.

The Marine Services division of **David Evans and Associates, Inc. (DEA)** is



McDonald

pleased to announce the award of a three-year, \$30 million capacity indefinite delivery contract with the National Oceanic and Atmospheric Administration (NOAA) to provide LiDAR (light detection and ranging) hydrographic surveying and related support services for anywhere in the United States. Airborne hydrographic LiDAR uses a blue-green laser to measure water depths up to approximately 2.5 times the visible depth. With this award, DEA becomes one of only two contractors in the nation selected to provide this service to NOAA over all U.S. territorial waters. This contract augments DEA's ongoing five-year hydrographic surveying and related support services contract with NOAA and continues DEA Marine's mission of being a premier provider of hydrographic surveying services to the U.S. government.

RBG a leading provider of fabric maintenance and construction support to the global energy industry, announced two internal promotions to its senior management team, marking the first time the company has promoted internally to this level. **Garry Lewis** has been appointed as UK Continental Shelf (UKCS) key account

director and **Roger Esson** has been promoted to sales director, both with effect from 1 September.

A recent change in RESON's board of directors will place **Michael Brock** as the new chairman of the Board of Directors. Brock has a background in acoustics and comes to this position with a wealth of knowledge and experience including terms as CEO of BK medical, a world leader in development and production of diagnostic ultrasound systems, Divisional Director at Brüel & Kjær Sound & Vibration Measurement and President and CEO at GN Otometrics.

T.D. Williamson, Inc. (TDW), a leading supplier of pipeline services and equipment, announced that **Bruce Thames** has been promoted to the position of Vice President – Eastern Hemisphere.

As of August 2, 2010, **Triton Group Holdings** was acquired by **Forum Energy Technologies**. Triton Group Holdings, through its subsidiaries, provides electric and hydraulic remotely operated vehicles (ROV) for inspection, survey, light intervention, and deepwater heavy construction applications.

Photograph by Jim Hegeman, Global Diving & Salvage, Inc., Seattle, WA, 2009

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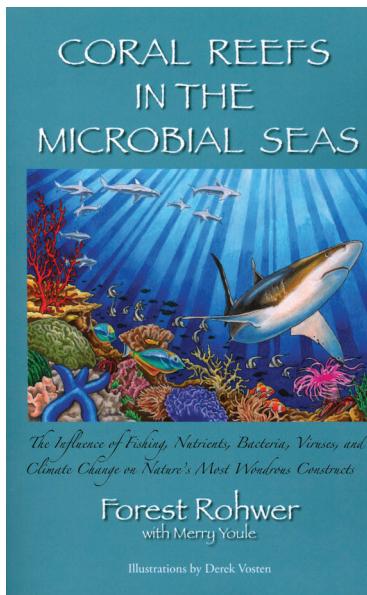
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Coral Reefs in the Microbial Seas



but to build the epic structures we know as coral reefs. However, since the 1980s the corals have been struggling. Both coral disease and bleaching have become widespread. The reefs in trouble are typically those that have been overfished or fertilized by nutrient-laden runoff from nearby shores or stressed by warmer temperatures. Any of those circumstances can disrupt the fine-tuned balance and lead to more algae. Combine two or more and the results can be disastrous. Photosynthesizing algae release dissolved sugars into the water; more algae release more sugars; more sugars fuel too many microbes—especially too many of the disease-causing sort; more dying corals make room for yet more algae to grow. This vicious cycle leads, in Rohwer's words, to the DDAMnation of coral reefs.

There is more to this story, including fascinating descriptions of how coral reefs work, the difficulties in diagnosing coral diseases, the coral's adaptable internal algal farm, and how we can give coral reefs a chance. Enjoy the good-natured banter on-board as Rohwer and a dozen other scientists travel to the remote Line Islands to unravel the connections between people, microbes, and the decline of coral reefs. This journey will delight everyone who is fascinated by the corals that, with their invisible microbial partners, have built the most impressive and biodiverse communities on planet Earth.

ISBN 978-0-9827012-0-1, Plaid Press, 201 pages.

The Deep Sea Quest for Amelia Earhart, by David Jourdan, follows his first book, *The Search and Discovery of Israel's Lost Submarine Dakar*. The disappearance of Amelia Earhart is possibly the greatest aviation mystery of the twentieth century. Amelia and her navigator, Fred Noonan, vanished without a trace in the vast Pacific near tiny Howland Island during their attempt to circle the globe on July 2, 1937. No wreckage, oil slick, or floating debris of any sort was ever found. Other than a few fleeting radio messages, there is no primary source to narrow speculation on their fate.

Over the last decade, David W. Jourdan, founder of the deep-sea exploration company Nauticos, and Elgen Long, famed aviator and author of the book *Amelia Earhart: The Mystery Solved* (Simon and Schuster, 1999), have teamed with engineers, analysts, researchers, sponsors, and investors to begin the most extensive high-resolution mapping of the deep-ocean floor in history. During the course of this work, Jourdan and his team launched two seven-week expeditions, in 2002 and 2006, in a quest to find Amelia Earhart's Lockheed Electra and put this mystery to rest.

Locating such a small target in one of the deepest and most remote places on the planet was one of the most daunting quests ever faced by ocean explorers. It involved dramatic and sometimes life-threatening situations encountered over the course of weeks at sea, far from help or rescue. Deep-towed sonars were used to map underwater topography to one-meter accuracy over an area as large as the State of Rhode Island. Volcanic calderas, extensive ridge systems, and massive seamounts never before seen by humans were revealed as the team imaged terrain on earth's final frontier.

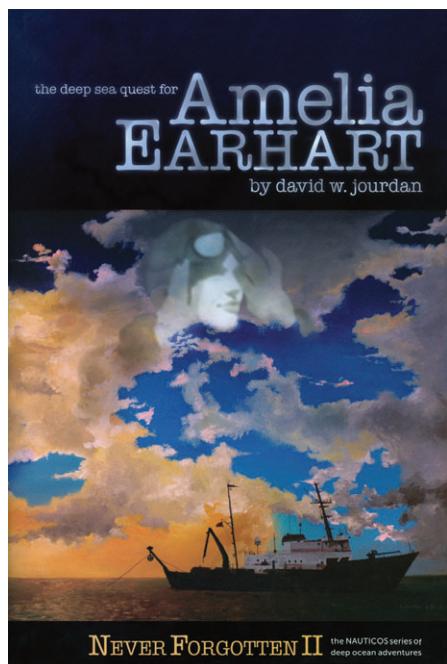
Deploying millions of dollars worth of equipment—spending a dollar every second—the expedition leaders and their supporters risked great fortune in the hopes of discovering an even greater historical treasure. The limits of equipment, endurance, nature, and even medicine were tested as the team pressed on.

The Deep Sea Quest for Amelia Earhart is a story for anyone interested in true-life mysteries, ocean adventures, the vastness of the sea, the business of deep-sea exploration, and engrossing technical solutions to seemingly impossible problems.

This is Book II of the Never Forgotten series of Nauticos ocean explorations and discoveries, remembering and honoring lost heroes and explorers. The first book, *The Search and Discovery of Israel's Lost Submarine DAKAR*, chronicled the effort to solve a thirty-year mystery, culminating in the location and salvage of the Israeli warship at a depth of 10,000 feet. It is the tale of the sixty-nine sailors who went down with the ship, and their loved ones' horror of loss, decades-long quest, and eventual closure once the wreckage is finally discovered.

ISBN 978-0-9843282-0-8. Ocellus Productions, 268 pages.

The Deep Sea Quest for Amelia Earhart



Calendar

October 12-14, 2010:
Offshore Middle East
Doha, Qatar
www.offshoremiddleeast.com

October 14–16, 2010:
Techno-Ocean 2010
Kobe, Japan
www.techno-ocean2010.com

October 17-22, 2010:
SEG
Denver, CO
<http://cf.seg.org/calendar>

October 19-20, 2010:
Clean Gulf 2010
Tampa, FL
www.cleangulf.org/

November 2, 2010:
2nd Annual New England Marine Renewable Energy Center Technical Conference
Cambridge, MA
www.mrec.umassd.edu/abstract2010.php

November 3-4, 2010:
3rd Annual MREC Stakeholder Conference/6th Conference on Clean Energy
Boston, MA
<http://greenovationconference.com>

November 2-4, 2010:
Offshore Communications
Houston, TX
www.offshorecoms.com

November 9-11, 2010:
Subsea Survey IRM
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[www. subseasurvey.com](http://www.subseasurvey.com)

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Website: www.hydrogroup.plc.uk
Contact: Michael Swan Tel: +1 562 492 1394

Design, Manufacture and Delivery of: Fiber Optic, Diver Communication, ROV Tether, Cat 5 Cables, Mini TV Cables, Push Rod Cables, Halogen Free Cables, Armored Cables, Buoyant Cables, Kevlar Strain Cables, Towed Arrays, Range Cables, Towed Sonar Cables, Thin Wall Conductor Cables, Welding Cables, Production Control Cables, Completion Control Cables, Cable Termination & Moulding, Pressure Testing to 10,000 PSI and 100 Meters MOQ ISO 9001:2008

CABLE & PIPELINE TRACKING

INNOVATUM Ltd.

Unit 11 & 12, Woodside Business Park, Ingham, BURY St. EDMUNDS, IP31 1NR, Suffolk, England, UK
Tel: +44(0)1284 729 123, Fax: +44(0)1284 729 133
E-mail: sales@innovatum.co.uk
Website: www.innovatum.co.uk
Contact: Terry Slater and Rob Nunn

SMARTRAK: High accuracy magnetic cable and pipeline tracking systems from the beach to 3000m water depth. **SMARTSEARCH:** for highly detailed magnetic mapping survey; magnetic debris search; pipe-route clearance; munitions/UOX survey; wreck location. For all ROV; towed sled; AUV and small vessels.

TELEDYNE TSS

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Teledyne TSS Ltd.

1 Blackmoor Lane, Croxley Business Park, Watford, Hertfordshire WD18 8GA
Tel: +44(0)1923 216020 Fax: +44(0)1923 216061
E-mail: tssales@teledyne.com
Website: http://www.teledyne-tss.com
Contact: Carolyn Jones
USA Office: 10801 Hammerly Blvd, Suite 128, Houston, TX 77043, Contact: Euan Mackay
Tel: (713) 461 3030, Fax: (713) 461 3099

Underwater detection systems for determining the location, relative position and burial status of offshore pipelines, umbilicals and subsea telecommunications & power cables.

CABLE PROTECTION



PMI Industries, Inc.

5300 St. Clair Avenue, Cleveland, OH 44103
Tel: (216) 881 4914, Fax: (216) 881 4920
E-mail: sales@pmiind.com
Website: www.pmiind.com

Underwater engineering service company specializing in highly reliable custom cable systems & hardware for the marine environment. **EVÉGRIP™** Termination: provides a full-strength field installable termination for use on electro-mechanical, optical cables and wire rope. **EVERFLEX™** Bending Strain Relief: used & applied at terminations where off-axis tension may occur. The unique split hardware design of the **DYNA-HANGER™** Suspension System offers mid-span bend protection & superior high strength holding that can be applied at any point along the cable. Our dynamic cable testing facility simulates at-sea mechanical environmental conditions.

CONNECTORS



AK Industries

3115 East Las Hermanas Street
Rancho Dominguez, CA 90211
Tel: (310) 762 1600, Fax: (310) 762 1616
E-mail: sales@ak-ind.com
Website: www.ak-ind.com
Contact: Allan Kidd

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



BIRNS, Inc.

1720 Fiske Place, Oxnard CA 93033-1863 USA
Int'l: +1-805-487-5393
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Fax: +1-805-487-0427
E-mail: service@birns.com
Website: www.birns.com
Contact: Eric Birns

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



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CONNECTORS

continued

BIRNS Aquamate

BIRNS Aquamate LLC

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Pawtucket, RI 02860 USA
Tel: 1 401-723-4242, Fax: 1 401-723-4243
E-mail: sales@birnsaquamate.com
Website: www.birnsaquamate.com
Contact: Eli Bar-Hai, Operations Director

Part of the BIRNS Group, Birns Aquamate LLC design and manufacture underwater electrical connectors, cable assemblies, and cable terminations. The company produces a wide range of standard industry connectors such as the 5500 Series, SC, MC, LP, FAWL/FAWM, Rubber Molded, etc. fully compatible with other manufacturers. Birns also specializes in fast turn-around for custom design of special connector solutions. Stocking dealers in the UK (Scorpion Oceanics) South Africa (Marine Solutions) Holland (Nautikaris and Seascape) and Brazil (MAKO).



Hydro Bond Engineering Ltd.

Hydro House, Claymore Avenue, Aberdeen Science & Energy Park, Bridge of Don, Aberdeen, AB23 8GW, UK
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E-mail: sales@hydrogroup.plc.uk
US Contact: Michael Swan Tel: +1 562 492 1394
E-mail: sales@hazardouslocation.com
Website: www.hydrogroup.plc.uk

Design and Manufacture and Delivery of: Submarine Pressure Hull Glands, Penetrators—NPT; UNF; DDC; Fiber Optic, Connectors—Deck Mateable; Underwater Mateable; Peek Light; and Non Magnetic, Terminations—Optical; Kevlar; Wire Armor; Hybrid Connectors, Offshore Installation & Termination; Moulding (P.U., P.E., P.V.C., Hytrel, Neoprene), Miniature Connectors, Exd Rated Connectors, Sensors, Junction Boxes, Moulding Kits. ISO 9001:2008



ODI-A Teledyne Majority Owned Company

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Toll Free: (888) 506 2326
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E-mail: marketing@odi.com
Website: www.odi.com

Vice President, Global Marketing & Sales
Tel: +1 386 236 0880 x1443
Cell: +1 407 342 7791
E-mail: jflynn@teledyne.com

ODI (Ocean Design, Inc.) is the world leader in subsea electrical and fiber optic interconnect systems. ODI's high reliability connectors, cable assemblies and junction boxes are used worldwide for offshore oil and gas, defense, oceanographic and research applications. ODI's wet-mateable connectors include signal and high-power electrical, fiber optic, and hybrid electro-optical products.

SEACON® Brantner & Associates, Inc.

1700 Gillespie Way
El Cajon, California 92020
Tel: (619) 562 7070, Fax: (619) 562 9706
E-mail: seacon@seacon-usa.com
Website: www.seacon-usa.com

The SEACON® Group are the leading manufacturers of underwater connectors, submersible switches, wet and dry mateable connectors, fiber optic and connector/cable assemblies, offering over 35,000 product designs. With locations in California, Rhode Island, Texas, Mexico and the UK, SEACON® is able to provide quick solutions with either existing or custom-designed connector products.



Subconn Inc // M.J. Stewart Associates Inc.

575 Washington Street, Unit 2
P.O. Box 328
North Pembroke, MA 02358
Tel: 781 829 4440, Fax: 781 829 4442, Mobile 781 361 2723
Website: www.subconn.com
Contact: Mike Stewart

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Website: www.interdive.co.uk
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IXSEA manufactures high-accuracy, acoustic positioning systems for the offshore, oceanographic and defense markets. GAPS, the pre-calibrated USBL system, combines USBL, INS and GPS technologies. It is the most accurate USBL in its category and works in deep and extremely shallow environments. POSIDONIA USBL acoustic positioning system is ideal for high-accuracy/ ultra long-range positioning of subsea vehicles.



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E-mail: tsssales@teledyne.com
Website: www.teledyne-tss.com
Contact: Carolyn Jones

Supplier of the Meridian range of IMO, Wheelmark and High Speed Craft approved surface and subsea gyro compasses. Options include heave, roll and pitch and battery backup versions as well as a range of repeaters and ancillary products. TSS also continues to support the world-renowned range of SG Brown gyro compasses and marine equipment.

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INSURANCE



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LIQUID STORAGE



Aero Tec Laboratories, Inc. (ATL)

45 Spear Road Industrial Park,
Ramsey, New Jersey U.S.A. 07446
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E-mail: atl@atlinc.com
Website: www.atlinc.com
Contact: David Dack

For over 40 years, ATL has specialized in the design and manufacture of custom bladder-type fluid containment systems, including bladder tanks, inflatables, pillows and bellows, for the surface and subsea industry. ATL's flexible fluid containers boast unparalleled chemical tolerance, abrasion resistance, and remarkable durability and can be used with methanol, diesel fuel, gases, ethylene glycol, hydraulic fluids and chemical cleaning cocktails. Expedited deliveries are also available.

MAGNETOMETERS



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Contact: Ross Johnson

Geometrics, a member of OYO Corporation, manufactures, sells, and services portable geophysical instruments for land, marine, and air investigations of the subsurface. Geometrics' product line includes proton precession and cesium magnetometers, high-resolution seismographs, and electrical conductivity imaging and resistivity systems. Geometrics' instruments are used around the world for natural resource exploration, geotechnical and environmental assessments, ordnance detection, locating archeological and treasure sites, teaching and research.



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Website: www.marinemagnetics.com
Contact: Rebecca Milian

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MARINE ENVIRONMENTAL CONSULTING SERVICES

CSA International, Inc.

8502 SW Kansas Ave
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E-mail: rmulcahy@conshelf.com
Website: www.csaintl.com
Contact: Bob Mulcahy

CSA International, Inc. (CSA) is a marine environmental consulting firm specializing in multidisciplinary projects concerning potential environmental impacts of activities throughout the world. With extensive experience in environmental sciences and technical field operations, CSA is staffed and equipped to offer a complete range of services for projects in offshore, nearshore, estuarine, wetland, freshwater, and terrestrial environments.

MOTION SENSING EQUIPMENT

IXSEA Inc.

Tel: +33 1 30 08 98 88, Fax: +33 1 30 08 88 01
E-mail: info@ixsea.com
Website: www.ixsea.com

IXSEA manufactures high-accuracy, acoustic positioning systems for the offshore, oceanographic and defense markets. GAPS, the pre-calibrated USBL system, combines USBL, INS and GPS technologies. It is the most accurate USBL in its category and works in deep and extremely shallow environments. POSIDONIA USBL acoustic positioning system is ideal for high-accuracy/ ultra long-range positioning of subsea vehicles.



KONGSBERG

Kongsberg Seatex AS

Kongsberg Seatex AS
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Website: www.km.kongsberg.com/seatex
Contact: Finn Otto Sanne <finn.otto.sanne@kongsberg.com>

Kongsberg Seatex is a leading international marine electronics manufacturer specializing in the development and production of precision positioning and motion sensing systems. Our commitment is to provide quality products and solutions for safe navigation and operations at sea in the commercial offshore, maritime, hydrographics and defence industries.

TELEDYNE TSS A Teledyne Technologies Company

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Houston, TX 77043, Contact: Euan Mackay
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NAVIGATION SYSTEMS-INERTIAL

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OCEANOGRAPHIC INSTRUMENTS



Nke Instrumentation

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E-mail: info.instrumentation@nke.fr
Website: www.nke-instrumentation.com
Contact : Yves DEGRES – Instrumentation Manager,
Valérie LE PEN – Sales Dpt.

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Sea-Bird Electronics, Inc.

13431 NE 20th St., Bellevue, WA 98005
Tel: 425-643-9866, Fax: 425-643-9954
E-mail: baldur@star-oddi.com
Website: http://www.seabird.com
Contact: Debbie Bresko

Sea-Bird is the leader in accurate, stable ocean instruments for measuring conductivity, temperature, pressure (salinity); oxygen; and related variables. Our CTD profilers, water samplers, moored CT recorders, wave/tide recorders, and DO sensors are used by research institutes, ocean observing programs, government agencies, and navies globally. Investments in engineering, metrology, calibration, software, and analysis make our products the best choice.

STAR:ODDI

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E-mail: baldur@star-oddi.com
Website: http://www.star-oddi.com
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A manufacturer of miniature data loggers with sensors as temperature, depth/pressure, salinity, compass, magnetometer, acoustic receiver, tilt in 3-D, pitch and roll. The small loggers are used for various researches, including oceanography, fisheries research, fishing gear studies, equipment behavioral monitoring and fish tagging. Data is presented in graphs and tables in the application software along with time and date of each measurement.

PIEZOELECTRIC CERAMICS

Channel Industries

A Division of Channel Technologies Group (CTG)
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E-mail: cisales@channeltech.com;
Website: www.channelindustries.com
K.Ruelas, pres.; E. Medina, vice-pres.; E. Bickel,
technical sales;
J. Sharon, sales/marketing

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

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DeepSea Power & Light

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E-mail: sales@deepsea.com
Website: www.deepsea.com
Contact: Pedram Pebdani, Oceanographic Sales Manager

PRESSURE TESTING



<http://deepsea.com/pressure.html>

4033 Ruffin Road San Diego, CA 92123 - (858) 576-1261



Submersible Systems Inc.

333 Progresso Road
PO Box 1843
Patterson, LA 70392
Tel: 985 395 0996, Fax: 985 395 0995
Website: www.ssirovs.com
Contact: Wolfgang Burnside

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VideoRay

580 Wall Street, Phoenixville, PA 19460
Tel: (610) 458 3000, Fax: (610) 458 3010
E-mail: brian.luzzi@videoray.com
Website: www.videoray.com
Contact: Brian Luzzi

VideoRay, the global leader in Micro-ROV technology has more than 1,400 Remotely Operated Vehicles (ROVs) deployed globally. Starting at just US\$5,995 and weighing just 8 pounds, VideoRay is ideal for surveys, offshore inspections, search & recovery, homeland & port security, science & research, fish farming, and other underwater applications. VideoRay is currently available on the General Services Administration (GSA) schedule. Visit www.videoray.com.

ROV BROKERS

MaRE Trans. Ltd.

Oil States Buildings, Blackness Road
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Aberdeen, AB12 3LH UK
Tel: +44(0)1224 870070, Fax: +44(0)1224 870071
E-mail: sales@m-are.com
Website: www.m-are.com
Contact: Mike Kernaghan

MaRE provides an International Brokerage and Equipment Sourcing service to the underwater industry. We are the world's leading source of used ROV systems and components. "DeepSearch", a free-issue database, is distributed monthly highlighting used ROVs and associated equipment for sale worldwide. Our Procurement department offers an equipment and spares sourcing service which complements the brokerage side of the business. MaRE also provides Consultancy on all aspects of remote underwater technology.

SLIP RINGS

SCHLEIFRING and APPARATEBAU GmbH

Am Hardtanger 10, 82256
Fuerstenfeldbruck, Germany
Tel: +49 8141 403-0, Fax: +49 8141 403-45
E-mail: mkrischak@schielfring.de
Website: www.schielfring.de
Contact: Stephan Bode and Martin Krischak

For many years the name SCHLEIFRING is a metaphor for unique, proven and utterly reliable transmission technology. SCHLEIFRING covers all sectors of the worldwide requirement for sophisticated contacting slip ring systems and non-contacting Rotary Joints for high data rate signal transmission as well as non-contacting power transmission.

SONAR SYSTEMS

Imagenex Technology Corp.

209-1875 Broadway St., Port Coquitlam
BC, Canada, V3C 4Z1
Tel: (604) 944-8248, Fax: (604) 944-8249
E-mail: imagenex@shaw.ca
Website: www.imagenex.com
Contact: Steve Curnew

Imagenex is an innovative company specializing in advanced acoustic underwater sensors. The company's products include multibeam, mechanical scanning, and sidescan sonars. The Delta T is a compact, cost-effective multibeam sonar, small enough to fit on most underwater vehicles for obstacle avoidance, navigation and profiling applications. The profiling versions feature an output for real-time 3D plotting and are compatible with third party post-processing software. The Model 881A is a small multi-frequency sonar for imaging or profiling applications. There is an Azimuth Drive available for the 837B Delta T and the 881A for profiling applications from stationary platforms. The Model 881L features improved performance via Ethernet communications. Two sidescan sonars, the SportiScan and the YellowFin, feature a revolutionary price/performance ratio. For more information please visit www.imagenex.com

IXSEA Inc.

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IXSEA manufactures high-accuracy, acoustic positioning systems for the offshore, oceanographic and defense markets. GAPS, the pre-calibrated USBL system, combines USBL, INS and GPS technologies. It is the most accurate USBL in its category and works in deep and extremely shallow environments. POSIDONIA USBL acoustic positioning system is ideal for high-accuracy/ ultra long-range positioning of subsea vehicles.

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[Marine Sonic Technology, Ltd.](#)

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White Marsh, VA 23183-0730
Toll Free: (800) 447-4804
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Website: www.marinesonic.us

Marine Sonic Technology, Ltd. builds high quality, high resolution side scan sonar systems. Located in Gloucester, Virginia, Marine Sonic has been in business for 20 years. Our towed systems are rugged, easy to deploy and easy to operate. We also offer highly efficient embedded side scan systems for use in AUVs which occupy minimal space in the vessel and operate with minimal power consumption



[Sonatech](#)

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K.Ruelas, pres.; R. Franklin, v.p., nav & range sys;
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Sound Engineering Solutions – Sonatech, A Division of Channell Technologies Group (CTG) develops innovative solutions for underwater acoustic applications. Existing technologies span a wide variety of acoustic systems, including sonar systems, navigation systems, and custom acoustic solutions. Our solutions are based on a 36-year career of developing high-performance, high-reliability undersea systems that are continually improved through research and development.

[SOUND VELOCITY PROBES/CTDS](#)

[SAIV A/S](#)

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E-mail: info@saivas.no
Website: www.saivas.no
Contact: Gunnar Sagstad

- STD/CTD, Sound Velocity probes/recorder with optional multi-parameter facilities; Turbidity, Fluorescence, Oxygen etc.
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[SWITCHES](#)

[Hydracon Company Inc](#)

Anaheim, CA USA
Tel: 1 714 281 2460, Fax: 1 714 281 1199
E-mail: alex@hydracon.com
Website: www.hydracon.com
Contact: Alex

Hydracon manufactures custom underwater devices. Examples include: switches proven worthy to NAVSEA testing and capable to 10,000 psi ambient, scuttle valves used on AUVs. "New Technology" switches feature abundant overtravel, fast response, low hysteresis, high reliability. Applications: Naval Defense, Power facilities, Deepwater Oil & Gas, Dredge systems. Many products are shown on the web site www.hydracon.com

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[International Transducer Corp.](#)

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Website: www.itc-transducers.com
K. Ruelas, pres.; Art Campbell, v.p.; Jon Monroe, sales & mktg.; E. Kuntsal, eng. mgr.

The Science of Sound Performance – ITC, a Division of Channel Technologies Group (CTG), designs and manufactures both custom and off-the-shelf underwater, air, and ultrasonic acoustic transducers, projectors, hydrophones, hydrophone/preamp, side-scan arrays, OEM and end-item products for commercial and military applications.

[UNDERWATER THICKNESS GAUGES](#)



[Cygnus Instruments, Inc.](#)

PO Box 6417, Annapolis, MD 21401 USA
Tel: (410) 267 9771, Fax: (410) 268 2013
E-mail: sales@cygnusinstruments.com
Website: www.cygnusinstruments.com

Contact: Rod Sanders

Cygnus manufactures the world's first true multiple echo ultrasonic thickness gauge. Multiple echo means that coatings, such as paint or epoxy, do not have to be removed in order to measure the steel. We offer hand held gauges that divers take into the water. Also have models that can communicate topside to a display repeater or PC. Also offer a range of shallow to deepwater units for ROVs. Manufacturing to ISO 9002 standards. Approved by classification societies.

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[DeepSea Power & Light](#)

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January/February

Editorial: Underwater Vehicles; Diving Technology

Distribution: • Underwater Intervention

Deadline: Jan. 15

March

Editorial: Ocean Exploration; Offshore Construction

Distribution: • Oceanology International

- NACE

Deadline: Feb. 12

April

Editorial: Exploration & Production; Defense & Naval Systems

Distribution: • Maritime Homeland Security Summit

- Future Naval Plans & Requirements
- OTC
- SubOptic 2010

Deadline: March 12

May

Editorial: Environmental Restoration; Ocean Instrumentation

Distribution: • Oceans IEE OES (Australia)

- UDT Europe (Germany)

Deadline: April 16

June

Editorial: Renewable Ocean Energy; Ocean Observing

Distribution: • EnergyOcean

- MAST Americas

Deadline: May 14

July/August

Editorial: Subsea Technology; Underwater Imaging

Distribution: • AUVSI

- SPE-ATCE

Deadline: July 16

September

Editorial: Oceanography; Maritime Security

Distribution: • Oceans 2010 Seattle

- AWEA/Offshore Wind 2010
- Clean Gulf

Deadline: Aug. 20

October/ November

Editorial: Offshore Communications; Survey/Mapping

Distribution: • Offshore Communications

- Mast
- Subsea Survey IRM
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Deadline: Oct. 8

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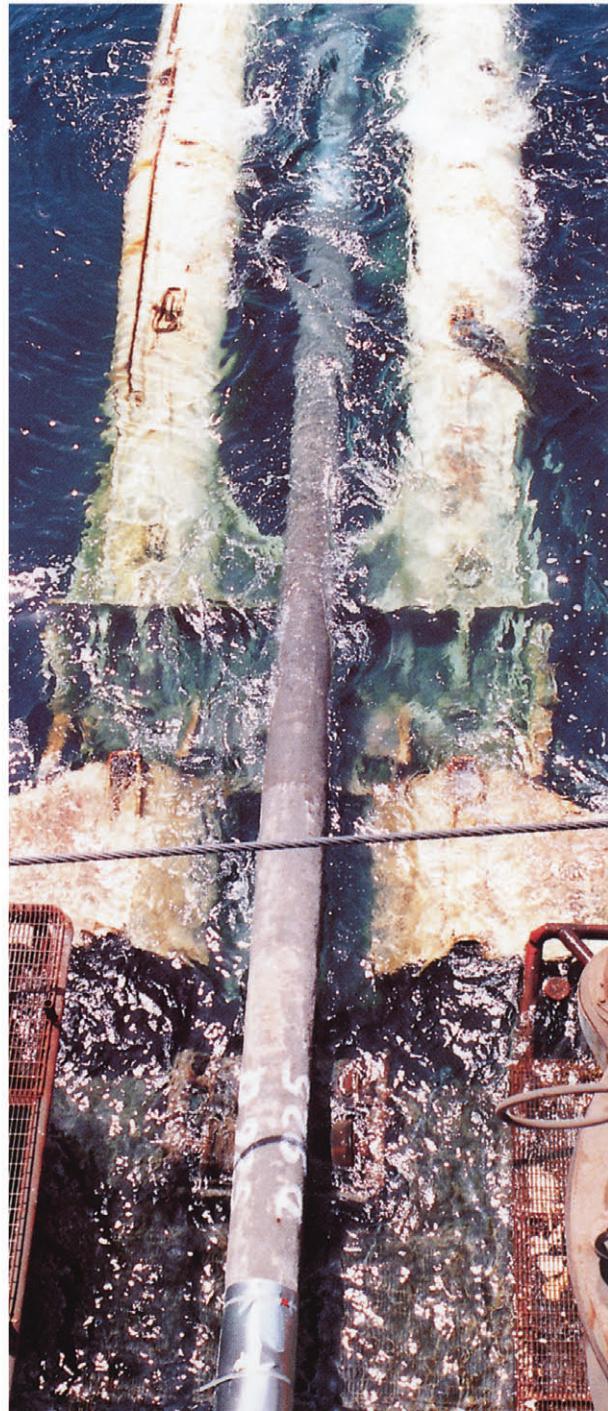
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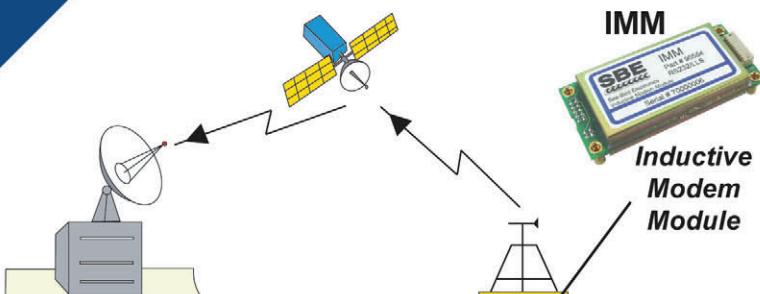


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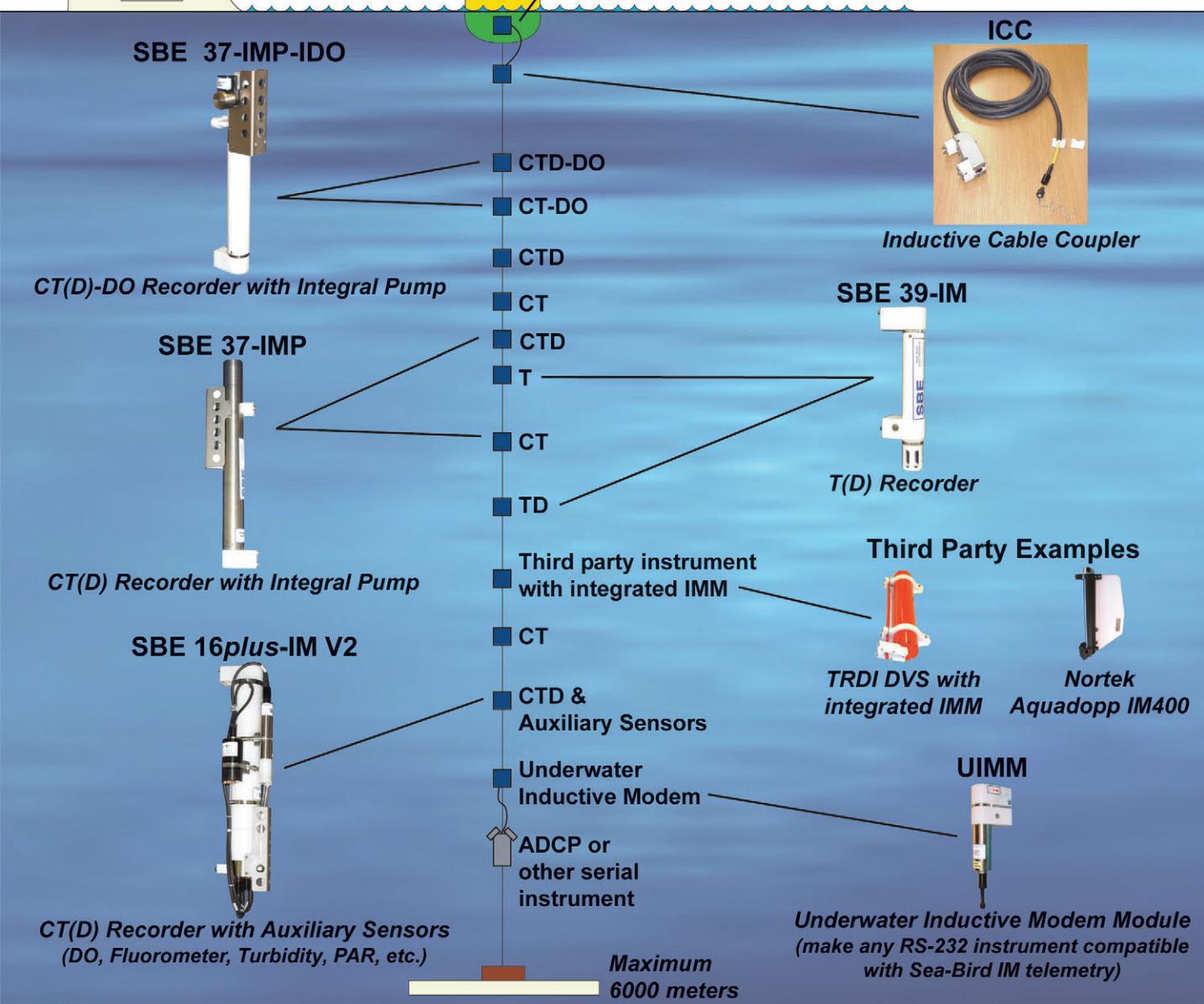
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