News for the Ocean Industry
Ocean News & Technology
www.ocean-news.com
November/December 2011

New Challenges in Ocean Survey

From Autonomous Platforms for Long-Term Data Collection to Renewable Energy Site Surveys

SeeByte and VideoRay Integrate Automated Piloting Capability onboard MicroROV

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Subsea Survey IRM

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ABOVE: VideoRay Pro 4 Remotely Operated Vehicle (ROV) inspects netting offshore. Low cost, low volume VideoRay ROVs are ideal for rapid, one man inspections of submerged assets down to 1,000 ft. (305 m) when diving is dangerous or costly. Photo: Christian Skauge - www.scubapixel.com

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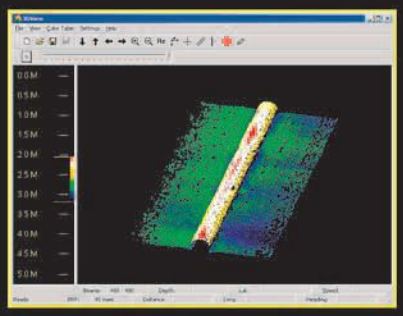
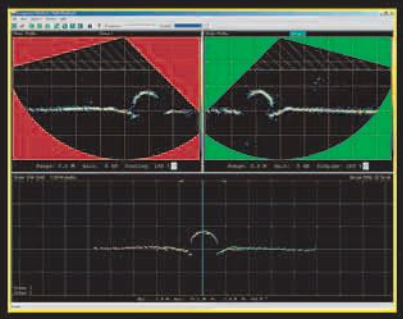
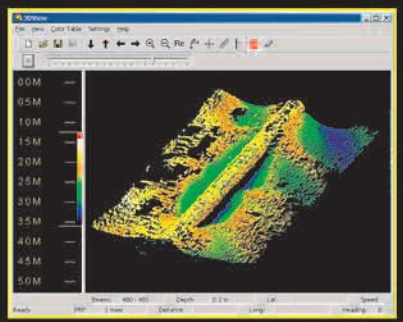
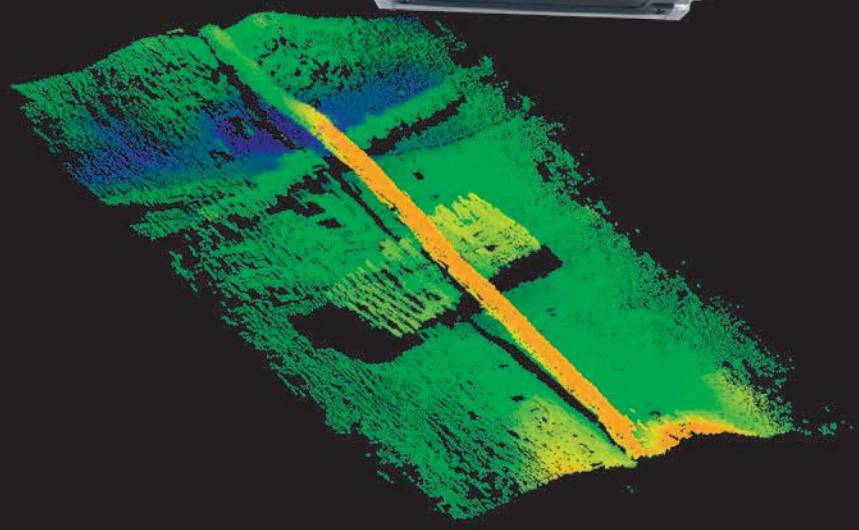






Model shown:
837B Delta T Profiler



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Offshore Industry

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Cover Photo

Cover Photo
VideoRay Pro 4 ROV Surveys the virgin Wreck of the Jan Hubert in Southern Norway with divers.
Photo Credit:
Christian Skauge
www.scubapixel.com

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More News, More Technology, More Data

in the next issue

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- Oceanography & Meteorology

Product Focus
- Diving Equipment
- Buoyancy Materials

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By John Manock

Subsea Telecom
Opportunities and Challenges

Ocean News & Technology

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When you talk about the subsea telecom market, everything is a matter of perspective. The market is less than 25 years old, but has already experienced more than its share of huge swings. There have been years when demand for new subsea telecom cable has exceeded the industry's manufacturing capacity by two or three times, followed soon thereafter by a near complete collapse of demand. Characterizing a particular year, say 2011, as weak or strong begs the question, "compared to what?"

Demand in 2011 for new submarine fiber optic cable for commercial telecom, not counting specialized applications such as energy or science-related networks, will finish the year in the 55,000-60,000km range.

An annual total demand of nearly 60,000km could be viewed as either weak or strong, depending on your perspective. If you compare it to previous boom years, when demand would exceed 100,000km, 2011 looks like mild. Compared to bust years, when demand would shrink to less than 20,000km, 2011 looks terrific.

One of the problems in placing a label on 2011 is that the subsea telecom industry is so used to being in a boom and bust cycle that it is hard to think in other terms. The reality, however, is that the industry is no longer subject to boom and bust periods. In 2009 and 2010, demand was between 40,000 and 50,000km per year. Combined with 2011, this is the longest period of moderate demand in the industry's history. It has reached an equilibrium that the industry has not seen before.

Why? There are a variety of factors that combine to create pressure on demand from above and below. Extraordinary Internet growth is pushing demand for new submarine cables. Cisco says that by 2015, global Internet traffic will reach 1 Zetabyte, a number so large as to be almost meaningless. As national economies become more and more dependent on the Internet, the damage caused by a loss of connectivity, even for a few hours, can be measured in the billions of dollars. This drives demand for multiple cable connections, even if a country already has a vast amount of spare capacity on existing cables.

In addition, access to the Internet is being considered more and more an essential human right. This is driving governments, NGOs, and even charitable organizations to provide funding for submarine cables to link some of the most remote populations in the world – populations so small that they would never justify the expense of a cable as a commercial venture.

So why doesn't demand for new submarine cables shoot through the roof? The answer is that equally powerful forces are pushing demand down. These include the technological developments that allow optical fibers to carry greater and greater capacities. The 10 Gigabit per second (Gbps) wavelength, which has been the standard for almost a decade, is now being replaced by 40 Gbps technology. 2011 saw the completion of the first large-scale upgrades to 40G wavelengths as well as contracts for new cable systems using the technology. Meanwhile, 100G technology is just around the corner and is already figuring in the planning of new systems.

Also helping to hold down demand is investor caution. The telecom market in general and submarine cable market in particular have not been greatly impacted by recent global financial turmoil. Telecom infrastructure upgrades are proceeding at a strong pace, and telecom carriers are reporting solid financial results. Investors are still cautious, however. The situation is most definitely not like the late 1990s boom when cable developers had no trouble raising billions of dollars for multiple cable systems to the same places. These cables could not be supported by the limited demand at the time and many went bankrupt.

As a result of these various factors, demand for submarine fiber optic cable is being held in the 40,000-60,000km range per year. With manufacturing capacity of the industry at about 60,000km annually, this steady period of demand will provide opportunities and challenges for subsea telecom suppliers.

Suppliers are dealing with this in different ways. One major cable maker announced recently that it is pulling out of the business. Other companies, however, have entered the market in recent years, particularly with submarine line terminal equipment. Those that are the most flexible and innovative will be the ones that achieve the greatest success.

It is interesting that economic turmoil, supplier tensions, and technological upheaval is resulting in a 3-year period of stable demand, but that is the nature of the subsea telecom business.

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SeeByte and VideoRay Join Forces for Automated Piloting of MicroROV

New capabilities provide exciting possibilities for low-logistics remotely operated vehicles

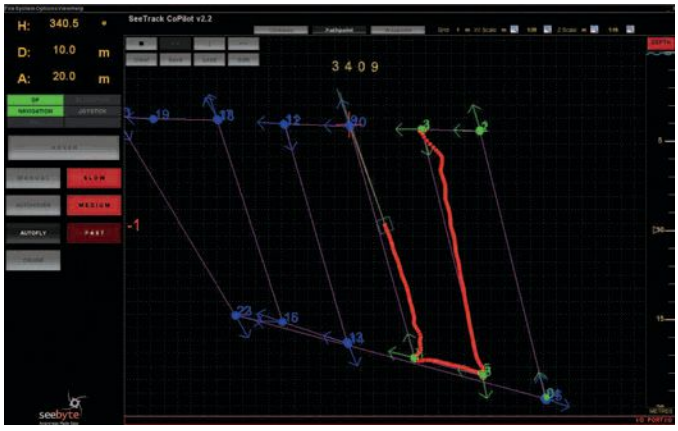
By VideoRay LLC and SeeByte

VideoRay LLC, of Phoenixville, Pennsylvania, USA, is a leader in the production and sale of Inspection Class Remotely Operated Vehicles (ROVs). These submersibles – which weigh less than 10kg in air with a full complement of sensors and instruments are used throughout the world for undersea search and inspection and port security. The United States Coast Guard has standardized on VideoRay's products, as have Navies and Coast Guards in many other countries throughout the world. Sonar and positioning system manufacturers support VideoRay vehicles first, due to VideoRay's market share and ease of integration. VideoRay will soon deliver its 2,000th system.

SeeByte, of Edinburgh, Scotland, is a leader in software systems for unmanned underwater vehicles, particularly software that provides control of both ROVs and AUVs (Autonomous Underwater Vehicles). SeeByte has provided software for the first autonomous inspection of riser pipes using an ROV without direct pilot control, which is one of the company's many world first accomplishments. SeeByte has produced software that flies ROVs along pipelines on pre-determined search patterns,and has enabled sonar target-tracking using a BlueView multibeam sonar.

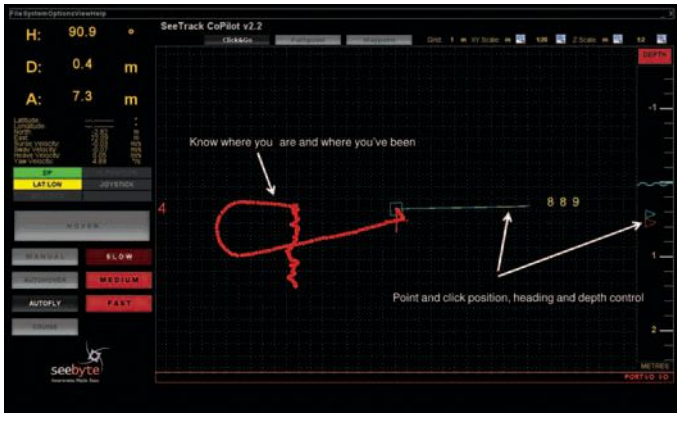
Benjamin Privat, engineer at SeeByte, programs the VideoRay ROVs automated course with SeeBytesCoPilot software (Photo Credit: SeeByte)

A recent integration of the Teledyne RDI Phased-Array DVL (Doppler Velocity Log) navigation with the VideoRay Pro 4 provided an opportunity to integrate SeeByte's SeeTrack CoPilot software, for the first time, on an observation vehicle. VideoRay's Pro 4 line incorporates a Windows-based laptop to drive the submersible and instrumentation in a comprehensive and cohesive manner through VideoRay's Cockpit software. Cockpit is designed for easy integration of third party software, and many leading vendors of sonars, other instruments, and positioning systems have taken advantage of this. Both VideoRay and SeeByte were eager to see how well SeeTrack CoPilot would work in this environment.

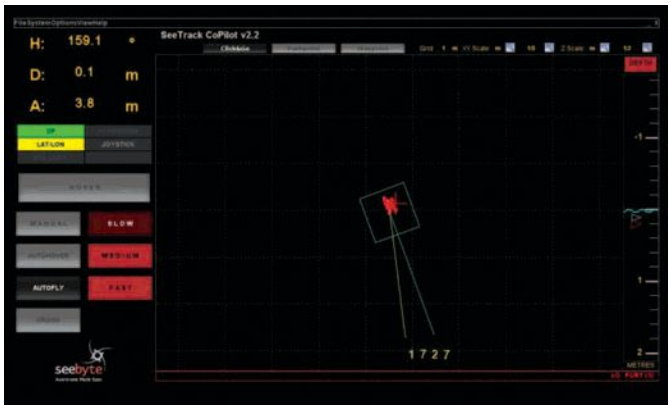


Pre-planned mission drawn and executed. The ROV autonomously runs the route. At any point the ROV can be re-routed with the click of a mouse or manually over-ridden by the pilot. (Photo Credit: SeeByte)

Initial trials produced successful results. The VideoRay Pro 4 completed several automated pre-planned maneuvers and was successfully re-routed from its pre-planned mission through a mouse point and click via the SeeByte CoPilot software interface, which works side-by-side with the VideoRay Cockpit software. Station keeping, an important feature in subsea ROV inspection work, especially in higher current conditions, was also successfully proven when the VideoRay ROV held depth and position in 0.5m/s current with Longitudinal position accuracy of +/- 10cm and depth held accuracy of +/- 10cm (see computer screen images).



Point and click position, heading, and depth control via the SeeByteCoPilot software – know where you are and where you've been at all times (Image Credit: SeeByte)



SeeByteCoPilot Software interface displaying VideoRay ROV station keeping data – in this case, the ROV held position in 0.5m/s current with Longitudinal position accuracy of +/- 10cm and Depth held accuracy of +/- 10cm (Image Credit: SeeByte)

The results were astounding. "The first attempt worked. We were pleased – and exceptionally motivated by this," said Alastair Cormack of SeeByte, who led the initial SeeTrack CoPilot migration. "This success is partially due to the fantastic software development kit and support by VideoRay – we're very excited about moving much of our software suite to the VideoRay platform."

Andy Goldstein, VideoRay's software manager and the chief architect of VideoRay Cockpit, was impressed by SeeByte's progress as well as the quality of the software they ported in a short time. "I've been following their work for a few years now" he said. "My goal is to work with them until everything relevant within the SeeTrack family is available to VideoRay users. Their solutions have a great deal of relevance to a wide range of users – military, offshore, first responders – anyone who can use help with automated piloting of their VideoRay."

VideoRay's annual VIPS ROV conference in Key Largo last month provided an excellent opportunity for SeeByte to demonstrate their early test software to a large group of VideoRay executives, employees, users, dealers, and hardware vendors. This group – consisting of over 150 underwater professionals — were able to use the test SeeTrack CoPilot software in a real-world port environment at the conference. In addition, a wide range of users – first responders, offshore contractors, inshore contractors, port security professionals, and others discussed their needs with SeeByte and VideoRay executives.

A spectator of the demonstration and attendee at the event, Dave Phillips, Undersheriff of St. Louis County Minnesota commented, "I was truly impressed by the ability to plan a survey and have the ROV follow it – it was done so easily. This advancement will dramatically shorten searches and increase confidence that areas have been cleared – definitely a valuable tool."

Bjarte Langeland, CEO of Stinger Technology AS commented, "I've been involved in cutting-edge technology with VideoRay in the North Sea Oil and Gas market for two years now. I believe SeeByte software controlling the VideoRay ROV piloting is one of the most important and significant developments I have seen to date."

"It has always been my goal to sort of 'engineer the talent' out of some aspects of VideoRay control" said Scott Bentley, president and founder of VideoRay LLC. "There is a computer controlling the thrusters, cameras, lights, and instruments and sensors on a VideoRay. But we still require the user to control each of these with manual joystick input, with the exception of auto-direction and auto-depth. This requires us to have each user practice how to swim the vehicle to a target or along a course, and that takes time, requires skill, and, of course, users can get a bit rusty if they don't do it regularly. In addition, repetitive tasks like flying to each of a long list of possible targets to identify or ground truth them or following a pipeline,can be very tiring. SeeTrack CoPilot is like cruise control in a car – but far more extensive and exciting. We can't make each user an expert overnight, but we can help new users accomplish tasks far faster and more effectively."

The VideoRay Pro 4 (right) completes an automated turn, re-routed from its planned mission through a mouse point and click via the SeeByteCoPilot software (Photo Credit: SeeByte)

SeeByte's experience on other much larger ROVs with their SeeTrack CoPilot software bears this out.

Following the meeting, Bob Black, SeeByte CEO, showed great enthusiasm regarding the potential to improve the capabilities and user experience in the microROV world. "I can see many, many areas where we will introduce VideoRay versions of software we've already engineered in other environments. When working underwater, the quality and accuracy of the mission, inspection, or survey are often dependent upon many external factors, such as the experience and ability of the operator, the quality of hardware, and the capacity to interpret and present multiple layers of data."

The VideoRay Pro 4 ROV breaks the surface (Photo Credit: Henning Klepp Christensen)

"Our advanced smart software systems provide a higher level of awareness, autonomy, and control that is less operator dependent and is centred upon transforming data into actionable information for imminent decision-making and planning. SeeByte's SeeTrack Military software is the de facto tool for mission planning and mine countermeasures for 12 of the world's Navies, while SeeTrack CoPilot and SeeTrack AutoTracker have seen the company partner with leading oil and gas corporations. Much of this is applicable to VideoRay missions."

VideoRay and SeeByte are actively soliciting beta test users for the new software packages under development. They expect to have prototypes available very soon, and commercial packages available in Q2 2012. Contact info@videoray.com or sales@seebyte.com for more information.

OCEAN INDUSTRY

MTS Oceans announces annual award winners

Among the top awards presented at the Annual Meeting held at OCEANS'11 MTS/IEEE Kona in Hawaii, September 2011, were those sponsored by Ocean News and Technology, Compass Publications, and Lockheed Martin.

The **Ocean News and Technology Young Professional Awards** are presented to two MTS members, Jacob Sobin and Evan Zimmerman who are still early in their careers who have, nonetheless, made valuable contributions to the Society. were honored with these awards.

MTS Fellow and publisher Dan White presents Jacob Sobin and Evan Zimmerman with the Ocean News & Technology Young Professional Awards

The **Compass Distinguished Achievement Award** was presented to Bruce Gilman, honoring his five decades of offshore experience, with particular emphasis on subsea intervention engineering and operations. The Compass International Award honored CONTROS Systems and Solution for their many outstanding contributions to the advancement of marine science and technology. The **Compass Industrial Award** honored Oceaneering International for its numerous innovations.

The **Lockheed Martin Award for Ocean Sciences and Engineering** was presented to Howard Shatto for his extensive technical achievements in marine science, engineering and technology.

Also honored at the Annual Meeting was Aimee Marsh, who was recognized with the **MTS Outstanding Service Award** and Benton F. Baugh, Peter Fougere, and Brock Rosenthal all became **MTS Fellows** — MTS' highest honor.

Japan finds 13th century shipwreck

Marine archaeologists say that the ancient wreckage of a ship discovered in the seabed off the coast of Nagasaki, Japan, belongs to the ancient "lost fleet" of ships deployed by China's 13th century Mongol ruler Kublai Khan. Explorers found the 20m long shipwreck some 25m off the coast of Nagasaki using ultrasound equipment, buried about a meter deep in the sandy seabed. Archaeologists believe the ship dates back to 1281 and was part of a 4,400-vessel fleet that China's Mongol rulers deployed in a thwarted attempt to invade Japan.

Blackbeard's cannon discovered

Archaeologists lifted a 300-year-old cannon from the pirate Blackbeard's ship off the coast of North Carolina. The 8-ft. long cannon was covered in sand and ocean debris. The sand-encased cannon will be taken to the Beaufort (N.C.) Maritime Museum for public viewing.

Animal rights suit filed

A federal court is being asked to grant constitutional rights to five killer whales who perform at marine parks. People for the Ethical Treatment of Animals is accusing the SeaWorld parks of keeping five star-performer whales in conditions that violate the 13th Amendment ban on slavery. SeaWorld depicted the suit as baseless.

The suit, which PETA says it will file in U.S. District Court in San Diego, hinges on the fact that the 13th Amendment, while prohibiting slavery and involuntary servitude, does not specify that only humans can be victims.

X PRIZE Foundation announces three-year, multi-million dollar sponsorship with Shell for prizes promoting exploration of space, oceans, and land

The X PRIZE Foundation, the leading nonprofit organization solving the world's Grand Challenges by creating and managing large-scale, global incentivized competitions, announced Shell as the exclusive presenting sponsor of the X PRIZE Exploration Prize Group, which aims to foster innovation through exploration to improve life on Earth. During the three-year, $9 million sponsorship, the X PRIZE Foundation will address these objectives through its incentive prize model to stimulate innovation, competition, and collaboration at the frontiers of space, our earth and its oceans.

Shell and X PRIZE announced the new partnership during an engaging roundtable event at the historic Explorers Club in New York City. At the event, world-renowned explorers shared their remarkable achievements as well as future scenarios for exploration of space, our earth, and its oceans that could lead to breakthrough innovations. To learn more about X PRIZE Foundation Exploration Prize Group, "Why do YOU Explore?" video campaign, or to access a webcast of the announcements, visit www.iprizeexploration.org.

$18M of silver found on shipwreck in North Atlantic

Odyssey Marine Exploration, Inc., a pioneer in the field of deep-ocean shipwreck exploration, announced that it has discovered a shipwreck that was torpedoed during World War I while carrying a shipment of silver. The SS Mantola sank on 9 February 1917, after being torpedoed by German submarine U-81. Odyssey discovered the shipwreck approximately 2,500m beneath the surface of the North Atlantic Ocean, approximately 100 miles from the SS Gairsoppa shipwreck whose discovery was announced in September by Odyssey Marine.

In 1917, the British Ministry of War Transport paid a War Risk Insurance Claim for £110,000 (in 1917 value) for silver that was on board the Mantola when she sank. This sum would equate to more

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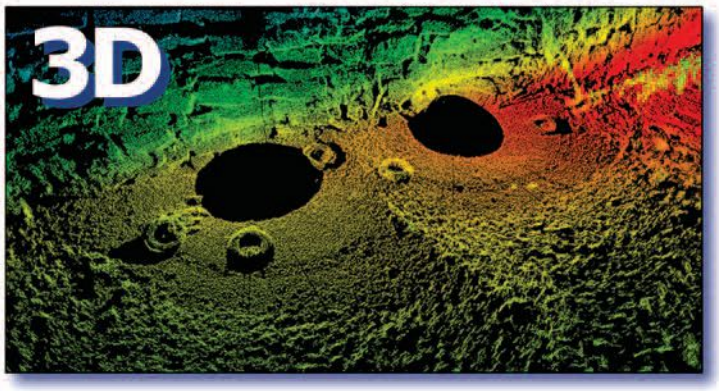

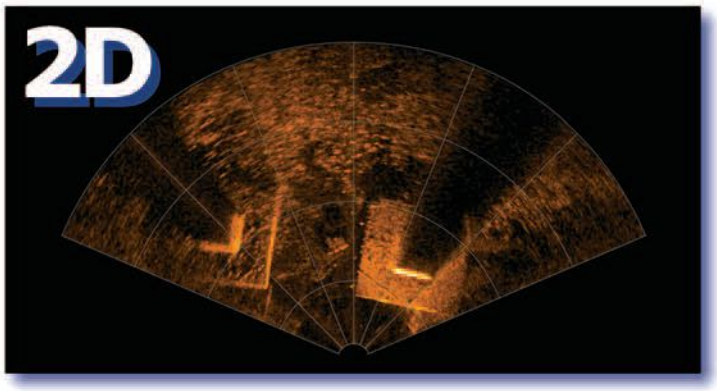

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than 600,000 ounces of silver based on silver prices in 1917. In September 2011, the UK Government Department for Transport awarded Odyssey a salvage contract for the cargo of the SS Mantola. Under the agreement, Odyssey will retain 80% of the net salved silver value recovered.

More information is available at www.shipwreck.net.

DIT and The Underwater Centre Form Training Alliance

Divers Institute of Technology and The Underwater Centre in Fort William, Scotland, have formed an alliance that allows U. S. dive school graduates to complete specialized training not available in the U.S.

To hold an internationally recognized saturation diving certificate, one must complete an approved closed bell saturation diver training program. This educational opportunity is not currently available in the U.S. Through this new alliance, DIT graduates — and those of other U.S.-based schools — can complete the Saturation Diving Course and the Remotely Operated Vehicle (ROV) curriculum at The Underwater Centre. Both courses are recognized by the International Marine Contractors Association (IMCA).

Both DIT and The Underwater Centre conduct their training in open water, under rigorous conditions, while ensuring that international training requirements are met or exceeded. This alliance means DIT is now able to provide U.S. subsea workers access to certifications that enhance their employability.

"The Underwater Centre shares DIT's goal to assist students in creating a global subsea career," says John Paul Johnston, executive director of DIT. "We're proud to be able to offer this advanced training to our graduates and the graduates of other U.S.-based training establishments who have obtained the prerequisite international certifications required for acceptance into this advanced training program."

For more information, visit www.diversinstitute.edu.

Kongsberg to perform noise study of wave energy device

Kongsberg Maritime Ltd, the UK subsidiary of global marine technology company Kongsberg Maritime, has been awarded a contract with leading wave energy technology provider Aquamarine Power to carry out underwater noise assessments relating to its Oyster wave energy device. The Oyster device has been developed by Aquamarine Power to capture wave energy from nearshore sites and convert it into clean, sustainable electricity.

The contract will involve the company measuring underwater noise during the Oyster installation and operational phases at the EMEC range, Billia Croo, on Orkney. The project scope will also involve Kongsberg Maritime determining the acoustic impact associated with installing and operating the Oyster device when it is subsequently operating in a high energy wave environment. This phase will take place off the northwest coast of the Isle of Lewis.

As part of the project, Kongsberg Maritime used its autonomous underwater noise recording system RUNES, to conduct baseline noise measurement at the Isle of Lewis site. The RUNES system, simple in its deployment method, is placed on the seabed over an extended period of time while recording baseline noise prior to any construction or installation work being carried out.

December 12-15, 2011 Houston, Texas

Subsea Survey IRM

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Don't Miss Out!

Subsea Survey IRM, now in its 6th year, is the only conference dedicated to survey, metocean and IRM. You won't want to miss out on the vast amount of information presented this year whether you are an operator, service provider or manufacturer. This year, Subsea Survey IRM will focus on the technology related to seafloor survey and mapping operations, metocean operations, and the demand for technology to meet the modern inspection requirements of the offshore energy industry and to enable effective repairs and maintenance accomplished by divers, ROVs, AUVs and remote monitoring technology. **NEW THIS YEAR**—Realizing the importance of accurate metocean in oil & gas operations, the topic is being added to the Subsea Survey IRM technical program. The collection of metocean data is often a requirement for offshore exploration, the quality assurance and analysis of collected metocean data are a vital component in the design, installation and operation of fixed structures, floating production facilities and pipelines. The metocean field continues to evolve with rapid changes in instrumentation, data analysis processes and our understanding of the physical processes of the environment.

Tuesday 9:00am - 12:00pm—Plenary Session

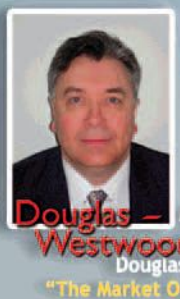
iPad Giveaway

Plenary Speakers Announced

Brian Braun, DeepStar Technical Project Engineer, Chevron Energy Technology Company
"Chevron's IRM Vision"

Michael Wilems, Jr. Facilities Manager, Gulf of Mexico Statoil
"The IRM Approach in the North Sea"

Paul Hillegeist, President & COO Quest Offshore Resources, Inc.
"Global Subsea Trends as Leading Indicator for IRM Activities"



Steven Kopits Managing Director Douglas-Westwood, LLC
"The Market Outlook for AUVs and AUV Manufacturers"

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December 12-15, 2011 Houston, Texas

Subsea Survey IRM

www.subseasurvey.com Marriott Westchase

Technical Program

Tuesday 9:00am - 12:00pm—Plenary Session

iPad Giveaway

Tuesday 1:30pm - 5:30pm—Technical Presentations

12:00 pm Lunch

Track 1

1:30 pm **Advancements in Pipeline Inspection with AUVs,** Einar Gustafson (Kongsberg Maritime), Chris Hancock (Kongsberg Underwater Technology)

2:00 pm **From Dynamic Positioning to Multiple Levels of Autonomy, the Journey of the Smart ROV**, Ioseba Tena, SeeByte

2:30 pm **Offshore Trials for the Marlin Offshore Platform Inspection System**, Dan McLeod, Sr. Program Manager, Lockheed Martin

3:00 pm Break

4:00 pm **Wave Glider UMV – Intro to a New Autonomous Remotely Piloted Ocean Data Collection Platform**, Brian Anderson, VP, Liquid Robotics Inc.

4:30 pm **Wireless Riser Monitoring**, Ian Crowther, WFS Technolgies, Ltd.

5:00 pm **Operational Monitoring of the GOM Loop Current and Eddies,** Neha Sharma, Horizon Marine

12:00 pm Lunch

Track 2

1:30 pm **Gulf Of Mexico Deepwater Current Structure Observations**, Pak Leung, Ph.D., Metocean Consultant, GL Noble Denton

2:00 pm **Integrating Integrity Management and Life-of Asset Benefits,** Dirk L. van Oostendorp, Xodus Group

2:30 pm **Work Class ROV Adaptability: Why Expandability and Flexibility is a Major Cost Saver,** Matt Whitworth, Schilling Robotics

3:00 pm Break

4:00 pm **Hurricane Downed Structures - Excavation Challenges and their Technical Solutions**, John Lariviere - Director of Projects, EPIC Divers

4:30 pm **Deep Water, Electric Line Cable Simulations for RLWI Operations**, Morten Iversen, Welltec

5:00 pm **Hydrocarbon Sniffers In Mobile Subsea Flowline Monitoring - A Field Report**, Daniel Esser, Managing Director, CONTROS Systems & Solutions GmbH

Tuesday 5:30pm- 6:30pm—Exhibitors Reception

Wednesday 8:30am - 5:30pm—Technical Presentations

Track 1

8:30 am **IRM and Jones Act Compliance,** David Medeiros, Manager, IMR Projects Group Oceaneering International, Inc.

9:00 am **Improvements in Internal Analysis Technology for Enhanced IRM of Hydrated or Blocked Subsea Pipelines**, David Wright, President, Wright's Well Control Services

9:30 am **Performing Work in the "Splash Zone"**, Christian Hagan, Project Manager, LBO, Inc.

10:00 am Break

Track 2

8:30 am **Environmental Monitoring with AUVs,** Chris Hancock, Kongsberg Underwater Technology

9:00 am **Monitoring Rig-Generated Underwater Noise in the Designated Critical Habitat of Cook Inlet, Alaska**, Adam Frankel, Marine Acoustics, Inc.

9:30 am **Risk Management: Fighting for Support**, Jay Stittleburg, Area Manager (Americas) for ULO Systems LLC (USA)

10:00 am Break

Color Code: Metocean • IRM Vehicles • Survey Software/Tools • Vessels/Diving • Integrity & Risk Mgmt

Program continued next page

Wednesday 8:30am - 5:30pm—Technical Presentations (continued)

Track 1

11:00 am **Accurate Time Tagging of Hydrographic Survey Data**, Lars Dall, Survey Manager, Eiva A/S

11:30 am **Reduced Cost Subsea Condition Monitoring Using 'Send and Forget' Acoustic Communication**, Andy Smerdon, Aquatec Group

12:00 pm Lunch

1:30 pm **Innovative ROV-based Inspection Solutions**, Derek A. Cruickshank, Commercial Manager, Fugro Subsea Services Ltd.

2:00 pm **Realizing True Benefits of Real-Time 3D Imaging Sonar Technology to Subsea IRM Application**, Blair Cunningham, Chief Technology Officer, Coda Octopus Products Inc.

2:30 pm **The Dark Art of Acoustic Positioning - NASNet® MkII**, Laura Cummins, Nautronix

3:00 pm Break

4:00 pm **Minimizing Offshore Exploration Risks by Evaluating the Charge of Subsea Structures**, Rick Schrynemeeckers. W. L. Gore & Associates, Inc.

4:30 pm **Subsea Inspection: Future Aspirations, Work Culture Change, and New Technologies**, Phil Howells, Harvey-Lynch, Inc.

Track 2

11:00 am **IRM Support Based on AUV & HYBRID ROV: Cost Effective FPSO/ FPU/ SPAR Mooring & Riser Inspection**, Jacques Schoellkopf, President, Advanced Subsea

11:30 am **"METOCEAN": Off-the-Shelf**, Rick Cole, RDSEA International, Inc.

12:00 pm Lunch

1:30 pm **The Affects of Biological Interference on Acoustic Current Velocity Measurements** Rosemary Smith, Fugro GEOS

2:00 pm **Concrete Coated Pipeline Remediation Project**, Matt Blalock, Triton Diving Services

2:30 pm **A High Resolution Ocean Current Model For Brasilian Pre-Salt Area Implementation & Validation Results**, Jacques Schoellkopf, Advanced Subsea, Inc.

3:00 pm Break

4:00 pm **A New Side Scan Sonar Developed Specifically for Unmanned Underwater Vehicles: Dramatically Changing the Range/Resolution/Power Paradigm**, Dr. Timothy J. Alavosus, Director of Sales and Marketing, Sonar Products, L-3 Communications Klein Associates

4:30 pm **Analytical Optimization for the Deployment of an ROV Tether Management System Through Splash Zone**, Bedros Mardikian, Installation Engineer, Gulmar Offshore

Color Code: Metocean • IRM Vehicles • Survey Software/Tools • Vessels/Diving • Integrity & Risk Mgmt

Thursday 8:30am - 10:30am—Panel Session

iPad Giveaway

The Underwater Vehicle—a futuristic look at IRM operations in the ultra-deepwater field—Part 2!

Last year's provocative panel session was highly acclaimed by delegates as a much needed, highly productive exchange of ideas and concerns. So this year Subsea Survey/IRM will continue the session where it left off. Updates and reports from the leaders in the field, followed by a continuation of last year's group discussion….Some panel members felt the ROV would not change from its current capability, others felt the ROV would become battery-powered and have no umbilical. Now, at least 3 AUVs slated for IRM use in the Gulf of Mexico and West Africa are blazing a trail for autonomous vehicles, guaranteeing this year's panel will be just as informative, enlightening and high-spirited as the 2010 session. The panel session is available to all registered full conference delegates.

Invited panel members include (in no particular order):

- Subsea 7
- Lockheed Martin
- Cybernetix
- Bluefin Robotics
- Schilling Robotics
- International Submarine Engineering (ISE)
- ROV Product Services
- Oceaneering
- Forum Energy Technologies
- SMD
- Saab Seaeye
- Kongsberg
- Douglas-Westwood

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List of Exhibitors
(as of Nov. 10, 2011)

214	ALPINE OCEAN SEISMIC SURVEY, INC.
302	AML OCEANOGRAPHIC
706	ASHTEAD TECHNOLOGY
208/210	BIRNS, INC.
307	BLUEFIN ROBOTICS
301	C&C TECHNOLOGIES
413/415	CDL UNDERWATER ENGINEERING
312	CODA OCTOPUS PRODUCTS, INC.
608	CSA INTERNATIONAL, INC.
307	DEEP OCEAN ENGINEERING
303/402	DOF SUBSEA
115	EDGE TECH
403	EGS
401	EIVA A/S
304/306	GEOSPACE OFFSHORE
307	HARVEY-LYNCH, INC.
112	IMAGENEX
400	LBO, INC.
407	LIQUID ROBOTICS, INC.
108	MACARTNEY, INC.
409	MARINE MAGNETICS
600	OCEANEERING
606	OCEAN SPECIALISTS, INC.
411	QUALITY POSITIONING SERVICES
122	ROTECH SUBSEA
126	SCHILLING ROBOTICS
119	SEACON
113	SIDUS SOLUTIONS LLC
107/109	SMD
712	SOCIETY FOR UNDERWATER TECHNOLOGY (SUT)
212	SOUND METRICS CORP.
708/710	SUBSEA 7
222/224	SUBSEA TECHNOLGIES, INC
117	SURVEY EQUIPMENT SERVICES, INC.
216	T. BAKER SMITH
300	T.D. WILLIAMSON
610	TECHNOLOGY SYSTEMS CORP.
218	TELEDYNE IMPULSE
218	TELEDYNE ODOM
218	TELEDYNE RD INSTRUMENTS
218	TELEDYNE TSS
714	THE HYDROGRAPHIC SOCIETY OF AMERICA (THSOA)
110	TITANIUM ENGINEERS, INC.
405	ULO SYSTEMS
604	UTEC SURVEY, INC.
310	WRIGHT'S WELL CONTROL SERVICES

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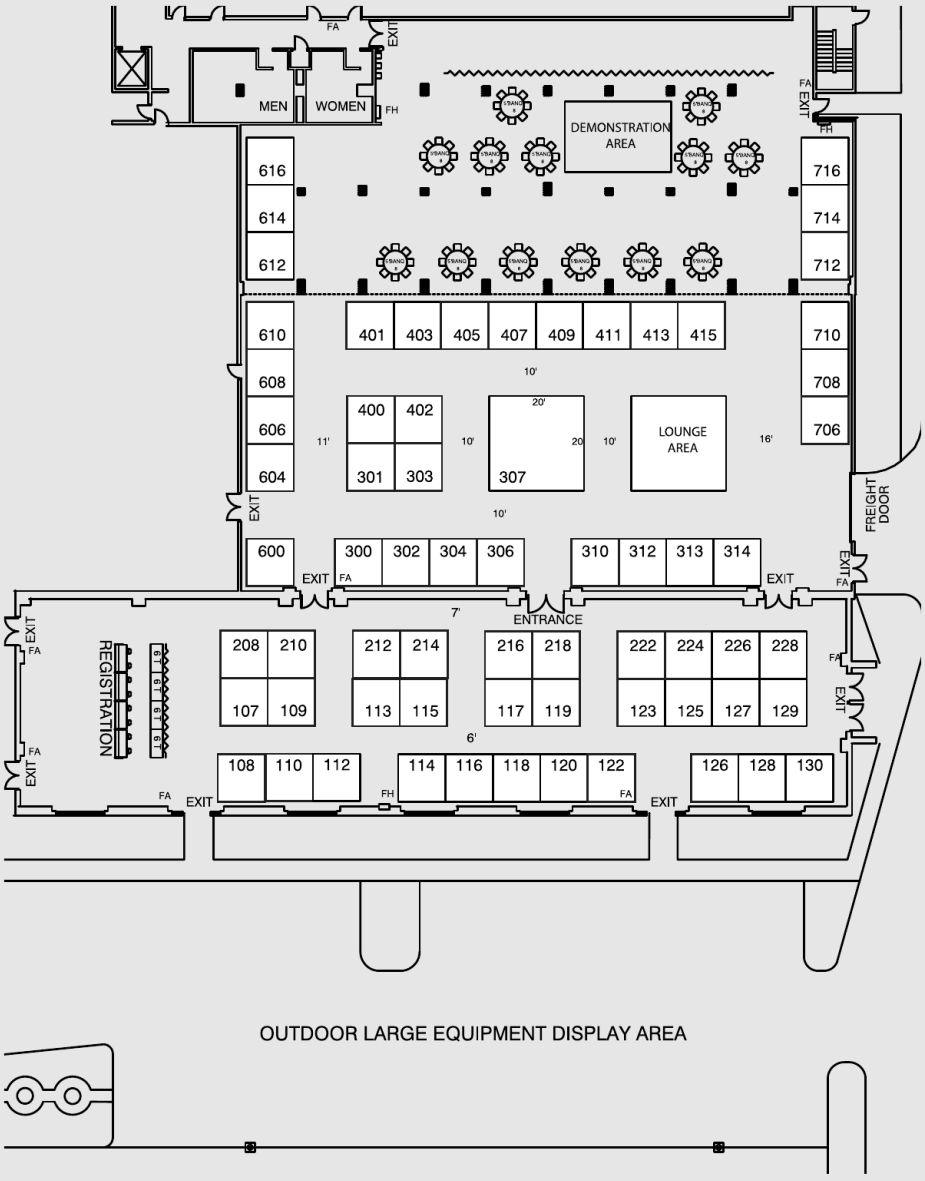


Conference Venue and Hotel
Houston Marriott Westchase

Subsea Survey IRM conference rate: $149.00 per night, based on availability (expires 11/27/2011).

Conveniently located in the rapidly growing Westchase Business District, the Houston Marriott Westchase Hotel is also located just minutes from the Uptown/Galleria area for some of the Country's finest shopping and dining.

The I-10 Energy Corridor in West Houston is only a few minutes from the hotel. The Marriott Westchase opens to a 10-story atrium lobby, a beautifully landscaped environment of varied dining and entertainment experiences. The Hotel has wonderful accommodations to offer: indoor and outdoor heated swimming pools, a fitness center and several dining options.

Bulk Carrier to Ride on Bubbles to Reduce CO_2

Mitsubishi Heavy Industries, Ltd. (MHI) has developed a new bulk carrier which it reports will enable reductions in CO_2 emissions by about 25% compared with conventional averaged bulk carriers. As the first commercial application of the new design, MHI will provide its conceptual design and green technologies to three grain carriers to be built for Archer Daniels Midland Company (ADM) of the U.S. MHI's new bulk carrier design adopts the company's proprietary Mitsubishi Air Lubrication System (MALS), which reduces frictional resistance between the vessel hull and seawater using air bubbles produced at the vessel bottom along with high-efficiency hull form and enhanced propulsion system. Sumitomo Corporation of Japan has received the order for the ship construction from ADM, and Oshima Shipbuilding Co., Ltd. of Nagasaki was selected to build the ships.

VIKING expands to Panama

Leading marine safety equipment provider VIKING Life-Saving Equipment AS has announced the addition of a Latin American sales and service facility located at Colon, Panama on 1 November 2011. The move to establish a presence in Panama is another step towards fulfilling VIKING's goal of expanding its network to include more service and stock points around the globe. The Colon facility is the latest in a long line of worldwide locations equipped to represent VIKING's entire line of products, including on-board services for lifeboats and marine fire equipment. The new location makes both the highly successful global service solutions such as the VIKING Shipowner Agreement and the wide range of quality marine safety equipment available to maritime operators in yet another important geographic location. The new 14,000 sq. ft. facility is situated in Panama's Colon Free Zone (C.F.Z.), the world's second-largest free zone, and a sprawling complex at the Atlantic gateway to the Panama Canal dedicated to the re-export of an enormous variety of goods to Latin America and the Caribbean (www.viking-life.com).

Kongsberg Maritime to supply marine simulators to Indonesian Seaman training center

Kongsberg Maritime has been selected to supply a large suite of Maritime Simulators to Barombong Merchant Marine College (BP2IP) in Indonesia. As part of the contract, Kongsberg Maritime will provide its world-class Polaris and Neptune Simulators for navigation and engine room training to the school's new facility. Following an open tender that saw Kongsberg Maritime's proven products and comprehensive proposal secure the contract, the simulation developer will install an extensive range of equipment and software at BP2IP's new ship-shaped training facility to help meet the increasing need for expert maritime training in the region. The scope of supply includes a ship's bridge simulator, engine room simulator, Polaris Crisis Management/Oil Spill simulator, GMDSS trainers, instructor stations, Exercise Area Database Creator, full mission ERS and target ship, and own ship hydrodynamic models (www.kongsberg.com).

M/V Signet Stars & Stripes and M/V Signet Constellation Christened

Trinity Offshore, LLC and Signet Maritime Corporation christened M/V Signet Stars & Stripes and M/V Signet Constellation at the Trinity Shipyard in Gulfport, Mississippi. This extraordinary affair included many of Signet Maritime's and Trinity Offshore's valued customers and employees in addition to many local, state, and national political figures.

Mrs. Gayle L. Wicker, wife of The Honorable Roger F. Wicker, U.S. Senator, Tupelo, Mississippi, christened the M/V Signet Stars & Stripes. Immediately following, Mrs. Tara E. Hauhe, wife of Mr. William E. Hauhe, General Manager, Angola LNG Supply Services LLC, Houston, Texas, christened M/V Signet Constellation.

The M/V Signet Constellation, Trinity Hull TO-22, was launched on 7 September 2011.

Both tugs are 100-ft. RAstar 3100 Class Terminal Support/Escort Tugs, built for Signet Maritime Corporation's U.S. Gulf of Mexico operations and will provide marine services to Angola LNG Supply Services (ALSS) in the Port of Pascagoula, Mississippi. The Robert Allan Ltd.-designed ASD tugs are built to American Bureau of Shipping Maltese Cross A1 Towing & Escort Service, Fire Fighting Class 1 (Fi-Fi 1), and Maltese Cross AMS standards. The vessels will be operated under Signet Maritime's ABS-certified International Safety Management (ISM) and ISO 9001-2008 Quality Management Systems. In addition, these vessels are the first EPA Tier 3, EU Stage IIIA, and IMO Marine Tier III vessels to be built and operated in the U.S. Gulf of Mexico.

Harvey Gulf signs contract with Trinity Offshore

Harvey Gulf International Marine has signed a deal with Trinity Offshore that will eventually produce the first two dual fuel LNG-powered offshore vessels under U.S. flag. The deal, reportedly worth at least $110 million, calls for the delivery of the first vessel in November 2013 with the second hull to follow about 4 months later. The vessels will be built in Trinity's Gulfport location.

Wärtsilä will deliver an integrated system that includes the dual-fuel machinery, electrical and automation package, complete propulsion, and the LNG fuel storage and handling components. The STX Marine Inc SV310DF Offshore Support Vessels will be powered by Wärtsilä 6-cylinder 34DF dual-fuel engines. The LNG storage capacity of 290

cubic meters, enables more than a week of vessel operational time. In addition, the vessels will carry 5,520 tons of deadweight at load line and have a transit speed of 13 knots. The vessels are scheduled for delivery in two years and will operate in the Gulf of Mexico.

Retrofitted hybrid tugboat to noticeably reduce harbor pollution

Foss Maritime, builder and operator of the world's first hybrid tugboat, has been providing cleaner air to the ports of Long Beach and Los Angeles since the arrival of the Carolyn Dorothy in 2009.

As a direct result of Carolyn Dorothy's success, Foss is retrofitting Campbell Foss, an existing Robert Allan designed dolphin class tug, with hybrid technology for service in San Pedro Bay.

Foss is utilizing Aspin Kemp and Associates (AKA) XeroPoint Hybrid Propulsion System, integrating Corvus Energy's industrial strength AT6500 lithium-polymer energy modules in a concentrated and innovative effort to continue its shift toward more environmentally conscious energy.

The Campbell Foss design utilizes 10 Corvus Energy AT6500 lithium-polymer modules, which will deliver a total of 65kWh of energy. The hybrid tugboat will match power sources, main diesel engines, auxiliary engines, and batteries with power needs for the work the vessel is performing.

The Carolyn Dorothy proved that a hybrid tug could deliver full power and operational capabilities while substantially reducing fuel, emissions and maintenance costs. The California Air Resources Board (CARB) validated that Carolyn Dorothy experienced emissions reductions of 73% for particulate matter, 51% for nitrogen oxides, and 27% carbon dioxide reductions when compared with its sister vessel operating in San Pedro Harbor.

Corvus Energy's AT6500 modules are, at minimum, 22% more powerful than current alternative lithium-ion competitors and are up to 10 times more powerful than lead-acid batteries in half the volume and a quarter of the weight. It's built to handle the world's most hazardous ocean conditions. Fully waterproof to 1 atmosphere, the modules can operate from -20°C to 60°C and feature standard shock ratings at 30G and 5-axis vibration ratings of 8G. The modules equal reduced battery replacement and maintenance, increased usable battery power, reduced weight, and a smaller footprint.

For more information, visit www.corvusenergy.com.

FMT Industries signs contract to build four 30,000 barrel fuel barges with Trinity Offshore

FMT Industries, LLC — an affiliate of Florida Marine Transporters, Inc. (Florida Marine) — has signed a contract with Trinity Offshore, LLC to build four 297.5 ft. x 54 ft. x 12 ft., 30,000 barrel tank barges. Florida Marine's Chairman and CEO, Dennis A. Pasentine, says, "The order is part of Florida Marine's ongoing commitment to meet its customers' needs. This contract for four barges and six option barges was awarded to Trinity Offshore due to its high quality workmanship and its large under cover production space." The barges will be built at Trinity's Gulfport, Mississippi facility.

John Dane III, Trinity Offshore's President and CEO, comments, "We are delighted to be awarded this FMT contract; it is a significant step for Trinity's reentry into the important Inland Barge Sector. The project will be the first to utilize Trinity's new panel line to be completed and in service within the next few months. The first barge will deliver in mid-2012, and the project will employ two hundred workers at its peak during the next 18 months."

The Florida Marine Group of companies provides quality marine transportation services throughout the inland waterways of the United States.

Trinity Offshore, LLC, with shipyards in both Gulfport, Mississippi and New Orleans, Louisiana, is a leader in the design and construction of commercial tugs, offshore vessels and patrol craft in aluminum, steel, and composite as well as oil field support vessels.

For more information, visit www.trinityoffshorellc.com.

Ocean Science

World's largest shark sanctuary declared in Marshall Islands
The Marshall Islands government has created the world's largest shark sanctuary, covering nearly 2 million sq. km of ocean. The Nitijela, the Marshallese parliament, has unanimously passed legislation that ends commercial fishing of sharks in all 1,990,530 sq. km of the central Pacific country's waters, an ocean area four times the landmass of California. The republic will ban trade in shark products and commercial shark fishing throughout its waters. Tourism, including diving, is a staple of the Marshall Islands archipelago, population 68,000 people. Sharks are seriously threatened by habitat loss and fishing. Approximately one third of ocean-going sharks are on the internationally-recognized Red List of Threatened Species.

America's wetlands in slight decline
America's wetlands declined slightly from 2004 to 2009, underscoring the need for continued conservation and restoration efforts, according to a report by the Department of the Interior's U.S. Fish and Wildlife Service. The findings are consistent with the Service's Status and Trends Wetlands reports from previous decades that reflect a continuous but diminishing decline in wetland habitat over time. The report, which represents the most up-to-date, comprehensive assessment of wetland habitats in the United States, documents substantial losses in forested wetlands and coastal wetlands that serve as storm buffers; absorb pollution that would otherwise find its way into the nation's drinking water,;and provide vital habitat for fish, wildlife, and plants. Wetlands are at a tipping point," said Secretary of the Interior Ken Salazar. "While we have made great strides in conserving and restoring wetlands since the 1950s when we were losing an area equal to half the size of Rhode Island each year, we remain on a downward trend that is alarming. This report, and the threats to places like the Mississippi River Delta, should serve as a call to action to renew our focus on conservation and restoration efforts hand in hand with states, tribes and other partners."

Woods Hole Group partners with Barnstable to ensure the long-term health of Lake Wequaquet
Cape Cod-based Woods Hole Group announced a new partnership with the town of Barnstable, Massachusetts to protect the long-term future of Lake Wequaquet. Woods Hole Group will be monitoring Lake Wequaquet to inventory Phosphorous sources, and to develop a long-term management plan to help the town address multiple uses and the sustainability of the lake for years to come. "This project gives us a chance to work cooperatively with the town and stakeholders to foresee and plan for possible future water quality concerns on the lake. There are questions related to the phosphorous balance, possible proliferation of invasive vegetation, and sometimes competing uses of this valuable Lake resource," says Bob Hamilton, V.P. and coastal engineer with Woods Hole Group since 1994. "Planning now will help to preserve the lake as an environmental and economic resource and will conserve town resources in the long run." Wequaquet, the largest lake in Barnstable at over 600 acres, is renowned for its beauty and recreational opportunities. The findings may also produce information to improve management of other lakes in the region.

Scientists identify the microbes that ate the natural gas from the spill


Scientist Molly Redmond with sample taken during the study

In the results of a new study, scientists explain how they used DNA to identify microbes present in the Gulf of Mexico following the Deepwater Horizon oil spill — and the particular microbes responsible for consuming natural gas immediately after the spill. Water temperature played a key role in the way bacteria reacted to the spill, the researchers found.

David Valentine and Molly Redmond, geochemists at the University of California at Santa Barbara (UCSB), conducted the study. The National Science Foundation (NSF) and the Department of Energy supported it.

The Deepwater Horizon oil spill was unique, according to Valentine and Redmond, because it happened at such great depth and contained so much natural gas — predominantly methane, ethane, and propane. Those factors influenced the way bacteria responded to the spill.

In earlier studies, Valentine, Redmond, and colleagues showed that ethane and propane were the major hydrocarbon compounds consumed in June 2010, two months after the April spill. By September 2010, the researchers discovered that these gases and all the methane had been consumed. In May and June of 2010, the scientists found that bacterial communities in the submerged plume were dominated by just a few types — Oceanospirillales, Colwellia and Cycloclasticus — and were very different from control samples without large concentrations of oil or gas. The bacteria were also very different from the microbial communities in surface oil slicks collected at the same time.

The bacteria Redmond and Valentine saw in the deepwater samples in May and June were related to types of psychrophilic, or cold-loving bacteria.

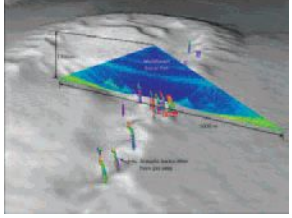
"Most bacteria grow more slowly at cooler temperatures — that's why we keep our food in the refrigerator," said Redmond. "But psychrophilic bacteria actually grow faster at cold temperatures than they would at room temperature."

"To figure out which bacteria were consuming methane, ethane, and propane, we used a technique called stable isotope probing in which we incubated fresh seawater samples from the Gulf with isotopically labeled methane, ethane, or propane," Redmond said.

The bacteria that grew as they consumed the methane, ethane, or propane converted the labeled gases into biomass, including their DNA. By sequencing the DNA, the scientists were able to identify the bacteria. The bacteria that consumed the ethane and propane were the same Colwellia in the samples from May and June, when ethane and propane consumption rates were high. They were abundant when the researchers incubated oil at 40° F, but not at room temperature. This suggests, say Valentine and Redmond, that the Colwellia grow well at low temperatures and can consume ethane and propane.

But questions remain about how the bacteria interacted with one another and how this affected the fate of the oil.

"This work continues to remind us that the ocean, its microbes, and petroleum hydrocarbons share an ecological history that extends far into the geological past," said Don Rice, director of NSF's chemical oceanography program, which funded the research.



Multibeam sonar maps gas seeps

A technology commonly used to map the bottom of the deep ocean can also detect gas seeps in the water column with remarkably high fidelity, according to scientists from the University of New Hampshire and the National Oceanic and Atmospheric Administration (NOAA). This finding, made onboard the NOAA ship Okeanos Explorer in the Gulf of Mexico, will lead to more effective mapping of these gas seeps and, ultimately, enhanced understanding of our ocean environments.

The mapping technology, multibeam sonar, is an echo-sounding technology that surveys a wide, fan-shaped swath of the seafloor, providing much greater coverage than the single-beam sonar systems previously used to map seeps. "We wanted to see whether we could map a large area of gaseous seeps effectively using this technology and how well the multibeam sonar compared to our very sensitive single-beam sonars," says Tom Weber of UNH's Center for Coastal Mapping, who was lead scientist of this mission. "It turns out it works wonderfully."

The multibeam sonar on the Okeanos Explorer produced data to make high-resolution maps of gas in the water column in depths ranging from 3,000 to 7,000 feet. Working jointly with scientists and technicians from NOAA's Office of Ocean Exploration and Research (OER) and the Bureau of Ocean Energy Management (BOEM), Weber and colleagues mapped more than 17,000 square kilometers of the Gulf of Mexico from 22 August through 10 September 2011.

Gas seeps – primarily but not exclusively methane – are numerous in the Gulf of Mexico, emanating from natural fissures in the seafloor. They can be associated with oil, but oil was not the focus for Weber and his collaborators. Finding and mapping gaseous seeps, says Weber, helps scientists better understand the ocean: its methane fluxes, carbon cycle, and deepwater marine environments. Further, the Gulf of Mexico is home to many active oil-drilling sites, and mapping the gaseous seeps in the water column will inform scientific as well as regulatory decisions. "In the deep ocean, there are life forms like tubeworms and clams associated with gas seeps, and they're treated as protected resources," Weber says. Further, mapping these seeps will give researchers baseline data on what exists in the water column, helping them determine whether future seeps are natural or unwanted byproducts of drilling.

Gulf Coast Task Force releases Ecosystem Restoration Strategy

The Gulf Coast Ecosystem Restoration Task Force, chaired by U.S. Environmental Protection Agency Administrator Lisa P. Jackson, released for public review and feedback its comprehensive preliminary strategy for long-term ecosystem restoration. The strategy, which will be presented to President Obama at the end of the public review period, represents a historic opportunity for addressing long-standing issues, such as loss of wetlands and stopping the flow of nutrients contributing to the decline of the Gulf's critical ecosystem. The preliminary strategy is the first effort of its kind to be developed with the involvement of parties throughout the region, including the states, tribes, federal agencies, local governments, and thousands of interested citizens and organizations. The plan strategy states specific steps for on-the-ground action and represents the Task Force's commitment to putting Gulf coastal restoration on equal footing with other national priorities.

Challenges of Geophysical Data Acquisition for Offshore Renewable Project Permitting in Federal Waters

By Rob Mecarini, President, Alpine Ocean Seismic Survey

Project permitting is currently one of the more vexing hurdles standing in the way of offshore wind projects. A key aspect of the process is collecting the data required to provide government agencies with the information they need to permit a site. Permitting in federal waters poses particular issues since the regulatory roadmap is still not fully developed. The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) has made great progress in the past couple of years to clarify its data collection requirements, most notably with the issuance of "Guidelines for Providing Geological and Geophysical, Hazards, and Archaeological Information Pursuant to 30 CFR Part 285" in April of this year. However, some issues remain unresolved, partially due to the fact that BOEMRE's role is providing its requirements for a final data set, not the best way to collect the data. In addition, BOEMRE's area of expertise is with oil and gas operations in the Gulf of Mexico. Oil industry projects have particular needs and requirements that are, in turn, reflected in the way data are collected, and therefore in what BOEMRE expects to have presented to them. Developers should be aware of the potential pitfalls when evaluating survey specifications and coordinate with BOEMRE during the preliminary phases in order to meet expectations.

Probably the largest pitfall in the collection of geophysical data for offshore wind farms is what is referred to in the BOEMRE guidelines as "Medium (Seismic) Penetration Sub-bottom Profiler." This is the data set used to determine the geological structure between 120 ft. and 200 ft. below the seafloor, depending on the turbine foundation design. The key decision is whether to collect single-channel or multi-channel data, as well as which sound source to use for data acquisition. In making this decision, developers need to balance cost against data quality, with single-channel data being cheaper to collect and process than multi-channel data. While multi-channel data is most likely to pass muster with BOEMRE, the agency leaves the decision up to the developer.

Single-Channel vs. Multi-Channel: The Issue of Multiples

The final product provided by multi-channel data is generally of better quality than that of single-channel because the collection method offers better signal-to-noise ratio, more information such as sound velocity values and multiple data points from different angles of the same section of seabed, and a larger tool box to work with for post-processing. One of the key problems it can mitigate is the presence of "multiples," which is the repetition of a data set within a data record. Multiples are created by several factors but one of the most common is water depth. For example, when working in 60' of water, the data set will start to repeat at about 60 ft. below the seafloor. When looking at the data record, the "multiple" overlaps the underlying data, thereby "covering" the real data and sometimes making it difficult to interpret.

If a developer wants to play it safe with BOEMRE's data review, it is advisable to opt for a multi-channel solution when multiples may show up within the part of the data record of relevance to the foundation design. This is especially true in the areas being considered for wind farm development in the Northeast. These areas are often composed of sands and gravels in horizontal bedding formation with very little structure. This situation makes it difficult to tell which are the real data reflectors and which are the reflectors from the multiple, since both look similar. The presence of multiples can also make it difficult to prove to BOEMRE that the required data penetration has been achieved and that subtle features, such as organic gas pockets, that may impact foundation stability have been delineated. The fact that geotechnical borings, which can be used to ground-truth geophysical data interpretation of single-channel data containing multiples, are required for each survey area and recommended at each wind turbine location, does not seem to currently mitigate BOEMRE's desire for extensive geophysical data and review.

All that said, when working in 120 ft. of water and trying to achieve 120 ft. of penetration below seafloor, single-channel should suffice since multiples will likely not be present. Multi-channel data will have more detail after processing, but usually the difference is not enough to justify the additional cost for either engineering or permitting purposes. Unfortunately, most wind farm projects are currently being considered in water depths that are less than the foundation depth of the wind turbine supports, so multiples may be an issue.

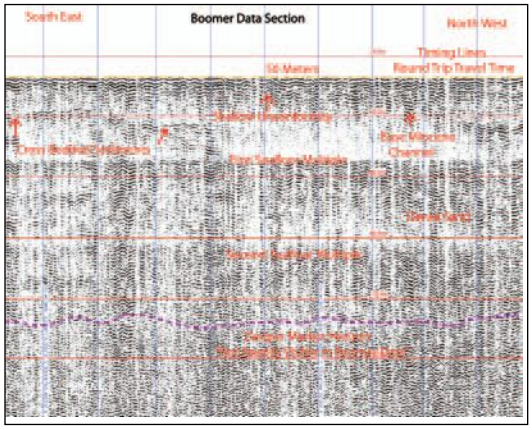
The good news is that although the multi-channel systems used for wind farm data collection provide high-resolution data, they are still far more compact and less expensive than those used for most oil and gas industry-related work. They also do not require the kind of loud sound sources, namely air guns, that cause permitting problems from the marine mammal harassment perspective. For the majority of wind farm sites, a 24-channel streamer using a 3.125m hydrophone group spacing and a sparker or boomer sound source should be adequate. Comparatively, oil patch engineering work usually requires a minimum of 48 channels with a 12.5m hydrophone grouping and an air gun sound source. The fewer channels and the closer the hydrophone grouping, the shorter the streamer. Combined with a simpler and more compact sound source, this means the equipment is not only cheaper, but it can operate off of a smaller vessel. The one catch is that streamers with this type of tight hydrophone grouping (3.125m) are not terribly common since they are not usually used in the oil and gas industry. This limits the number of contractors capable of performing this kind of survey work.

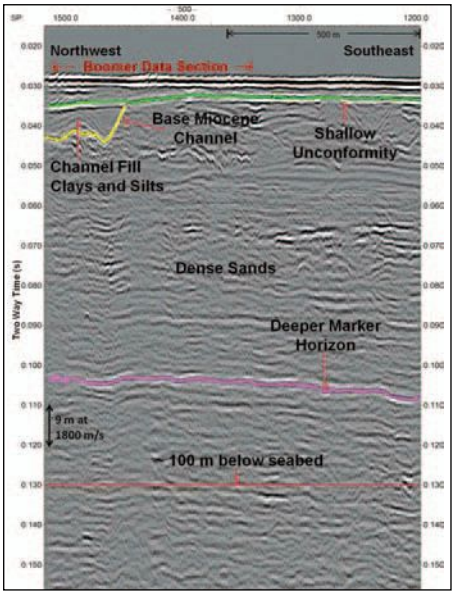
Selecting a Sound Source

Another issue to be aware of when designing the geophysical data collection portion of a wind farm survey is the sound source used for collecting the "Medium (Seismic) Penetration Sub-bottom Profiler." As mentioned, BOEMRE's guidelines specifically reference using a boomer system. The advantage of the boomer is that it produces a fairly clean signal that results in good quality data. However, most boomers on the market today top out at 350 Joules of power; depending on the geology of the project area, a boomer system may not be able to provide the signal

strength to penetrate to the depth below seafloor required for the foundation design. Unfortunately, using BOEMRE's suggested sound source does not excuse the developer from not achieving required penetrations.

This situation obviously needs case-by-case evaluation, however, when in doubt, it is advisable to go to a more powerful sound source such as a sparker. Sparker systems operate at similar frequency ranges as the boomer, but their design allows for a greater energy output. Sparkers come in many varieties, and selecting the right unit is essential to good data collection. Many sparkers, especially the cheaper ones, produce a "dirty" and inconsistent signal that can impact data quality and BOEMRE's satisfaction with the results. But, higher end units can provide signals that are comparable to a boomer and, barring the presence of sound-absorbing organic sediment or bedrock, ensure that the required seafloor penetration is achieved. Good sparker systems are slightly more expensive than boomers, but in the grand scheme of a project cost, should not have a significant financial impact.





Example of data collected for Fisherman's Energy at the same location with a boomer single channel system (top) and a sparker multi-Channel system (bottom). Note that data were collected in opposite directions.

Fishermen's Energy Case Study

The Fishermen's Energy Offshore Wind Farm Met Tower survey conducted in 2009 by Alpine illustrates of the challenges of this particular aspect of BOEMRE's data collection requirements. The project was conducted off the coast of New Jersey approximately 19km offshore Atlantic City in 20m of water. The area has a very homogenous geology, with the exception of some buried channels. At the time the project was conducted, the specifications for offshore wind farm surveys had not been fully developed. Fortunately, BOEMRE has updated its specifications to be far clearer as they relate to offshore renewable energy projects and has improved lines of communications with developers.

During the planning phases of the project, budget was an obvious concern. Alpine was very familiar with the geology of the work area and did not expect to find anything to impair the tower installation. In addition, the specifications required a geotechnical boring at the work site, which would ground truth whatever interpretation of the geology was derived from the geophysical record. The understood purpose of collecting the geophysics was to look at the area in broad strokes to discover buried channels and other issues that would seriously impact foundation engineering. Based on these assumptions, and the fact that BOEMRE did not specify the use of multi-channel acquisition, Alpine recommended the use of a less expensive single-channel boomer system with a sparker system as a back-up.

When BOEMRE reviewed the data, its major concern was the presence of multiples, which hindered its ability to see subtle changes in the homogenous geology and determine whether the required depth of penetration below seafloor had been achieved. Because of the dominance of its Gulf of Mexico operations, BOEMRE was used to receiving multiple-free multi-channel data. In addition, because of the horizontal bedding present at the work site, there were few differences between the geological structure of the data in the multiple and that of the underlying data set: penetration became hard to prove and the data difficult to interpret, especially for those unfamiliar with the local geology. Ironically, the very lack of geological variation that made multiples an issue indicated a lack of real concerns to foundation design. Furthermore, the geotechnical boring taken at the site confirmed Alpine's interpretation of the geological structure of the site. Nevertheless, BOEMRE exercised caution and deemed the data to be inconclusive; they required Fishermen's Energy to collect multi-channel data. Alpine acquired the multi-channel data at the same time as the survey it conducted for Fishermen's six-turbine demonstration site located in state waters offshore Atlantic City, New Jersey. The multi-channel data confirmed Alpine's previous geological interpretation and because the method met BOEMRE's expectations, the data set was accepted as complete and adequate for evaluation of the site prior to met tower installation.

Conclusions

As a rule of thumb, when working on wind farm projects where foundation designs require installation to a depth below seafloor in excess of the water depth at the site, it is advisable to conduct a multi-channel geophysical survey in order to be able to process out data multiples and improve data quality. This approach will help ensure that the data are acceptable to BOEMRE and will provide engineers with clearer information for design development. The cost savings of single-channel data collection do not stack up to the costs of re-acquiring data. In addition, it is highly advisable to consult closely with BOEMRE during the survey planning stages. Since the Fishermen's Energy surveys were undertaken, BOEMRE has enacted specific systems that provide developers with effective lines of communication to BOEMRE during the survey planning process. Based on the trends we have been seeing, it is very possible that as more projects in federal waters move into the data-collection phase, multi-channel will become a de facto standard for foundation design.

For more information, visit www.alpineocean.com.

Robert Mecarini is president of Alpine Ocean Seismic Survey, based in Norwood, New Jersey Part of the Gardline Group, Alpine conducted the geophysical and archeological surveys for both wind farm sites being developed by Fishermen's Energy. The company delivers turn-key marine data collection services for offshore renewable energy, civil engineering, shoreline protection, submarine cable, oil, and natural gas projects.

Interconnected European offshore grid will save billions of Euros

Offshore grids connecting North and Baltic Sea wind farms to electricity consumers will be substantially cheaper to build than expected according the European Offshore Wind Association (EWEA). Building "hub connections" at sea instead of using cables to connect single wind farms individually to the shore will result in investment costs that are 14 billion Euros lower. Additionally, if these hub connections were combined with an even more interconnected "meshed grid," the necessary additional costs of 5 to 7 billion Euros would be compensated by 16 to 21 billion Euros of additional benefits over 25 years of grid operation. The cost for creating the complete meshed offshore grid, including wind farm connections, would amount to about 0.1 Eurocent per kWh consumed in the EU27 over the project lifetime. The OffshoreGrid project, co-financed by the European Commission, proves the financial benefits of building a meshed European grid offshore and outlines two cost-efficient designs, but warns that a new regulatory framework is needed to enable its construction.

DNV releases updated standard for offshore wind turbine structures

DNV's recognized standard for design of offshore wind turbine structures has been through a revision process together with the wind energy industry. The updated standard that aims to reduce cost and increase safety is now available. The standard, Design of Offshore Wind Turbine Structures (DNV-OS-J101), provides principles, technical requirements,, and guidance for design, construction, and in-service inspection of offshore wind turbine structures. After its launch in 2004, it has been widely used in the offshore wind industry. This is the third revision of the standard, and the updated document has been through a comprehensive peer review process involving many leading industry experts in addition to DNV's internal quality review process.

Maersk partners with Apex for North American wind energy

Apex Offshore Wind, LLC and Maersk Line, Limited (MML) announced that they have established a working relationship to support the development, financing, and construction of utility-scale offshore wind energy facilities in North America. MML is a subsidiary of A.P. Moller-Maersk, a global corporation with a long history of successful operation in offshore energy. MLL has decided to partner with a reputable offshore wind energy firm to collaborate on the development of potential wind energy projects. MLL views offshore wind energy as a way for the company to expand its existing portfolio of maritime technical and transportation services and to build upon its commitment to environmental sustainability. "MLL has chosen to partner with Apex Offshore Wind to speed the process of bringing offshore wind to North America," said Greg Moore, vice president of business development at MLL. The Apex Offshore Wind management team has been working to develop offshore wind energy projects in North America for over 9 years. Apex sees significant potential for the industry's growth and supports the U.S. government's vision of an offshore wind energy sector capable of providing 54GW of clean domestic energy by 2030.

MacArtney helps bring offshore power onshore

Unlike many other tide energy capturing renewable energy devices, the SR250 floating turbine from Scottish renewable energy company, Scotrenewables, is a floating tidal device. The 33m long, 100 tonne SR250 is fixed to a mooring turret that is tethered to the sea floor. The construction of the turret allows the turbine to move with the direction of water movement, positioning itself automatically for optimal energy capture in much the same way that windmills turn to face the oncoming wind.

Harnessing the renewable power is just one part of the process – it also needs to be exported to the grid onshore through a medium voltage cable. The Scotrenewables design that combines a dynamic turbine mounted on a tethered turret can put significant strains on the riser section of the export cable. Designing the right cable and connector infrastructure system was important from the outset to ensure that power harnessed by the turbine could be reliably fed to the onshore grid. Scotrenewables chose MacArtney to provide the infrastructure for its 250kW prototype, and its design is a result of close cooperation between engineers from both companies.

Infrastructure that connects dynamic systems to static cable anchoring needs to be carefully designed to reliably maintain power and signal contact as the turbine moves horizontally with the tide as well as vertically with wave movement. The SR250 turbine has a turret and a vertical swivel. At the turret, a 6.6kV wet mate connector acts as a stab plate. As the turbine turns about this axis to face the water flow, this swivel turret holds the dynamic unit on the anchoring and the swivel ensures that the signal and power connections in the cable remain intact and prevent them from twisting during the 360° movement.

Scotrenewables and MacArtney worked together to custom design the 6.6kV umbilical that can carry the required 250kW. For this prototype, the 3,500m cable also has two signal STPs (screened twisted pairs) that transfer data to and from the turbine to shore.

Protecting the cable extends its functional life and preventing bending and twisting of the cable at the termination point is vital for preventing cable fatigue and failure. At the point of contact between cable and turbine, a steel stress termination on the high voltage wet mateable connector pair take the strain off the cable. The termination point where the cable exits the stress termination is also vulnerable as vibrations in the cable can weaken it over time. A bend stiffener was designed into the system to dampen the vibrations to help protect the cable from fatigue and extend its working life.

The system will be tested in the waters off Orkney for two years, exporting power to the grid. Testing the turbine in real sea conditions will provide the company with invaluable advice and experience before producing the full-scale 1 to 2MW version.

Evopod to undergo tests

A tidal stream turbine moved a step closer to providing community tidal power in Scotland having reached an agreement for lease with The Crown Estate for a test site in Sanda Sound, South Kintyre.

The potential deployment in the Sanda Sound of Evopod™, a floating, tethered device from Oceanflow Development, is now currently undergoing checks by Marine Scotland and its environmental consultees in order to obtain a licence to start a scaled-down test of what, at full-scale, could be installed in tidal stream sites such as the Pentland Firth.

Evopod is easier to install and maintain than devices positioned on the seabed. The company is hopeful that it will get Marine Scotland approval and is well on the way to having its first grid-connected tidal stream system in place by mid-2012.

Sanda Sound represents a scaled down version of the Pentland Firth, where it sees significant potential for farms of Evopod devices where, at full-scale, each device could power around 1,000 homes.

Oceanflow Development, the Scottish subsidiary of Oceanflow Energy, intends to use the Sanda Sound site for long-term testing of its floating tethered tidal stream technology. The sub-50kW test device will be grid connected and could be a forerunner to other community energy scale tidal power projects around the coastline of Scotland. Oceanflow is using the project not just to trial its technology, but to understand its interaction with the environment and has funded environmental surveys over 2010/11, including seabird and marine wildlife surveys and will continue to monitor the environmental sensitivity of the device once it is installed — which is planned to take place in mid-2012.

OPT to showcase technology innovation in Spain

Ocean Power Technologies, Inc. (OPT), a leading wave energy technology company, is pleased to announce the launch of a new technology initiative to enhance the efficiency of the Company's patented PowerBuoy® wave energy systems under the Company's existing "WavePort" project.

OPT will be working with a consortium of European companies and institutions to advance the energy conversion system of the PowerBuoy device through the development of a new wave prediction model. The new system will assess the characteristics of each incoming wave before it reaches the PowerBuoy wave power station, thereby providing more time for the electronic tuning capability to react. It is expected that this will significantly boost the power output of the PowerBuoy and reduce cost per megawatt hour of energy produced.

This technology, which will be incorporated into OPT's next generation power conversion control system, will be showcased in a new PB40 PowerBuoy to be built under the WavePort project and installed at an existing mooring site at Santoña, Spain. This PowerBuoy will draw on the experience gained through the development and grid connection of a PB40 in Hawaii as well as the successful in-ocean operation of OPT's first PB150 utility-scale PowerBuoy deployed in Scotland earlier this year.

The grant to OPT is part of a total award of $6.2 million to a consortium of companies, including OPT, to deliver a PowerBuoy wave energy device under a project entitled WavePort.

For more information, visit www.oceanpowertechnologies.com.

The Sailbuoy Unmanned Ocean Vessel for METOCEAN Instrumentation

By David Peddie, Dept. Manager/Scientist, Christian Michelsen Research AS

Introduction

With the advance of electronics, geo-positioning, and communication, remote automatic systems and instruments are becoming more advanced. You can pack loads of more functionality into a smaller space than before and, at the same time, consume much less power. This, in turn, leads to smaller and cheaper instrumentation.

Today, the majority of automatic remote systems are either geo-stationary or drifting (e.g. anchored platforms, weather balloons, drifting buoys or land based platforms). These kinds of platforms are reliable, proven and well understood from an operational and data processing point of view

Since remote unmanned systems are relatively new, they are not yet as proven compared to traditional remote instrumentation. In addition to carrying instrumentation, the remote unmanned systems also have to reliably navigate and move. The ability to navigate and move adds major challenges to the design of unmanned systems.

There are many challenges in designing remote unmanned systems, but for long-term unmanned systems, one of the greatest design challenges is power. Some remote vehicles, like most unmanned aerial vehicles, include the energy to propel the vehicle onboard. However, this results most often in the vehicles operational time to be limited to days or weeks. One remarkable exception is AUV gliders that store enough energy to propel themselves and power the instrumentation for months at a time.

An obvious solution for propelling a vehicle for longer periods of time is to harvest energy from the environment. This can be in the form of sun, wind, wave, or other kinds of environmental energy. In doing so, the energy requirement is reduced to steering and operating the vehicle.

Another challenge is structural robustness. Normally, a remote unmanned vehicle contains a number of moving parts and often highly refined surfaces. The vehicle will be exposed to the environment for months at a time and has to maintain functionality. The challenge is how to design the vehicle to be robust enough to

withstand the environment without adding to much weight or drag and consequently degrading its performance.

SailBuoy Concept

CMR has built automatic remotely operated instruments for the last 40 years, so the knowledge of these systems was well understood. Also the instrumentation CMR builds is for long time operation in harsh environmental conditions. With this knowledge an idea emerged in 2005 of an unmanned sailing vessel that could operate at sea for months at a time. As CMR is a Norwegian company, this means that it will have to operate in the North Sea during the winter conditions. Thus, it has to withstand and navigate in gale conditions with little or no sunlight for months at a time.

Initially the purpose of this vessel was to be a buoy that could keep its position at sea regardless of wind and currents. It was to be equipped with oceanographic and meteorological instrumentation as a replacement for anchored buoys.

CMR SailBuoy

Concept development and testing has been conducted since the beginning, improving and verifying the design. A variety of prototypes were tested to analyze and improve the design.

The CMR SailBuoy is designed to be an unmanned ocean vessel for oceanographic and meteorological instrumentation. It is a sailing vessel for long-term offshore autonomous operation. Using its onboard computer and servos, it automatically navigates a user-defined track. In essence, the SailBuoy is a 6 ft. autonomous sailing vessel using the wind as the only propulsion system. It is a configurable offshore sensor platform designed to support a wide variety of instrumentation payloads and is designed to keep stationary or travel from point to point. Data are transmitted to and from shore in real time using satellite communication.

Instrumentation

The SailBuoy has a 60L storage space for instrumentation. The weight of this instrumentation is currently limited to 10kg. The instrumentation can be configured in different ways. It can be completely self-contained with its own satellite communication and batteries or the sensors can be integrated as part of the SailBuoy's onboard computer.

For reliability and predictability, the SailBuoy is powered solely from its internal batteries. However, the SailBuoy can be equipped with 25W of solar panels to power instrumentation. This is especially useful if the sensors/instrumentation is power intensive.

Communication

The CMR SailBuoy uses the Iridium satellite system for communicating measured parameters and diagnostics. Since Iridium is a 2-way communication system, commands such as new waypoints, tracks, and configuration parameters can also be sent to the vessel underway.

The SailBuoy is integrated into CMRs Iridium Data Service. IDS is a web based real-time communication system displaying the SailBuoy's position on a map. Data retrieval and vessel control are also managed through this intuitive interface (see http://iridium.cmr.no). It is accessed using a webbrowser where all the information is presented.

Capabilities

As mentioned before, energy consumption is critical for autonomous vehicles operational time. The CMR SailBuoy is designed in such a way that it easily can operate for a year at sea without exhausting its batteries. It is also extremely robust so that it withstands rough sea conditions for long periods of time. Tests have shown that it can accurately navigate in gale conditions.

Applications

The SailBuoy can be used for a wide variety of ocean applications, from measuring ocean and atmospheric parameters to tracking oil spills or acting as a communication relay station for subsea instrumentation.

Scientific applications include - climate science, oceanography, meteorology, seismic monitoring, marine mammal monitoring, algae tracking or wave measurement. Industrial applications include emission monitoring, fisheries management, aquaculture, visual inspection, subsea communication, transportation, wave measurement, oceanography and meteorology.

Performance

The SailBuoy is an unmanned ocean vessel designed for offshore operations. On occasions when there is no wind, the Sailbuoy will drift with the currents. Also, the SailBuoy needs plenty of space to navigate. This means that operating the vessel close to shore is not advisable. Testing has shown that the current navigational accuracy offshore is around 2 nautical miles. The average speed over time is around 1.5 kt. though speeds of 5 kt. have been registered. These values depend largely on weather and current conditions. The ability to sail in most weather conditions is an important feature of the SailBuoy. It has been shown that it navigates well in breeze and gale conditions. As long as there is wind, it is not much affected by ocean currents.

Operation

The SailBuoy is easily deployed and retrieved. The CMR SailBuoy is a 2m long sailing vessel and weighs 60kg fully loaded. That means it can be easily handled by two people. Using a small boat, it can be towed a few miles offshore before it starts sailing on its own or it can also be lowered directly on the sea from a larger vessel. It will then proceed to navigate towards a predefined position.

Retrieval can be conducted with ease since the vessel's position is remotely controlled and can be told to wait at a chosen pickup point.

Field trials

In late 2009, a 24-hour sea trial was conducted. During this trial, the design of the vessel was verified to work together with the ability to navigate in severe weather conditions. The vessel was able to navigate in +15m/s winds and over 2m waves. To our surprise, it didn't only maintain position in gale conditions, but actually had no difficulty in making headway against the wind, waves and currents.

Since 2009, a number of trials have been conducted, both offshore and inshore. The latest trial was this summer where it traveled a 1,000km predefined course in 10 weeks. During this trial, it traveled successfully through some of the strongest currents in the North Sea. The SB01 SailBuoy has been tested for a total of 2,500km.

Conclusion

The CMR SailBuoy is an exciting new tool for ocean observation enabling data gathering at much more cost effective way than traditional methods.

For more information, visit http://sailbuoy.no.

GD wins Surface Mine Countermeasure Unmanned Underwater Vehicle contract

General Dynamics Advanced Informational Systems Inc., McLeansville, North Carolina, has been awarded a $48,606,916 contract with cost-plus-incentive-fee, cost-plus-fixed-fee, and firm-fixed-price line items for the engineering, manufacturing, and development of the Surface Mine Countermeasure Unmanned Underwater Vehicle (SMCM UUV), which will be part of the Littoral Combat Ship MCM mission package. The SMCM UUV system will provide the fleet mine warfare commander with enhanced mine-hunting capability and address the Navy's need to reliably detect and identify undersea volume and bottom mines in high-clutter environments and areas with potential for mine case burial. The SMCM UUV will also gather environmental data to provide intelligence support for other mine warfare systems. SMCM UUV system will be a part of this contract, which will also contain an option for the production of up to five low rate initial production systems and includes options which, if exercised, would bring the cumulative value of the contract to $86,719,986. The contract will be initially funded with $10,119,000.

Navy names new Joint High Speed Vessel

Secretary of the Navy, Ray Mabus, joined Ackerman, Mississippi, Mayor Dick Cain to announce that the name of the Department of the Navy's next Joint High Speed Vessel (JHSV) will be United States Naval Ship (USNS) Choctaw County, during a brief ceremony at Ackerman High School, Ackerman, Mississippi. This will be the first naval vessel to serve as the county's namesake, an honor shared by Choctaw counties also located in Alabama and Oklahoma. Capable of transporting 600 short tons, 1,200 nautical miles at an average speed of 35 knots, the JHSV can operate in shallow-draft ports and waterways, providing U.S. forces added mobility and flexibility. JHSVs also have an aviation flight deck to support day and night air vehicle launch and recovery operations. Additionally, the ships have berthing space for up to 146 personnel and airline-style seating for up to 312. The USNS Choctaw County will be constructed by Austal USA in Mobile, Alabama.

Navy commissions nuclear submarine California

The Navy's newest nuclear-powered submarine was commissioned, making California the eighth Virginia-class sub to join the fleet. Designated SSN 781, the California is built to excel in anti-submarine warfare; anti-ship warfare; strike warfare; special operations; intelligence, surveillance, and reconnaissance; irregular warfare; and mine warfare missions. Adept at operating in both the world's shallow littoral regions and deep waters, California will directly enable five of the six Navy maritime strategy core capabilities -- sea control, power projection, forward presence, maritime security, and deterrence. The 7,800-ton California is built under a teaming arrangement between Huntington Ingalls Industry-Newport News Shipbuilding and General Dynamics-Electric Boat.

USCG, NOAA nab drift net violator 2,600 miles offshore

The U.S. Coast Guard (USCG) announced that, in cooperation with federal and international partners, it has seized a fishing vessel and crew suspected of large-scale illegal high-seas drift net fishing in the North Pacific Ocean and is delivering them to the Alaska Division of the National Oceanic and Atmospheric Administration Office of Law Enforcement for the investigation.

Renegade large-scale, high-seas drift net fishing indiscriminately kills massive amounts of fish and other marine life such as whales and turtles by means of enormous nets suspended for miles in open water. The practice is universally condemned and is a significant threat to ocean ecosystems and to the food and economic security of nations that rely on fishery resources.

Acting on vessel sighting information provided by a maritime patrol airplane from the Fisheries Agency of Japan, 7 September, the U.S. Coast Guard Cutter Munro launched its MH-65 Dolphin helicopter and crew and located the fishing vessel Bangun Perkasa with 22 fishermen aboard, approximately 2,600 miles southwest of Kodiak, Alaska.

The Bangun Perkasa's crew reportedly abandoned their fishing nets and attempted to leave the area once they spotted the helicopter flying above them. The vessel was determined to be operating without valid flag state registration and seized as a stateless vessel for violations of U.S. law. A Munro boarding team determined the vessel had more than 10 miles of drift net, 30 tons of squid, and approximately 30 shark carcasses aboard. They retrieved the abandoned net and began the lengthy escort toward Dutch Harbor, Alaska.

During the transit, the Coast Guard boarding team discovered rats aboard. The Coast Guard understands the serious ramifications that may occur if an invasive species is introduced to the local ecosystem; therefore, the Coast Guard is working closely with state, local, tribal, and agency partners to ensure all precautions and procedures are being followed to mitigate the rat infestation aboard the Bangun Perkasa before it will be allowed into port.

NOAA's Office of Law Enforcement will take the case from the Coast Guard for further investigation into illegal fishing activities by this and any related vessels as well as into those behind and profiting from this unlawful activity. Once the investigation is completed, NOAA will forward its findings to the U.S. Attorney's Office.

"The seizure of the Bangun Perkasa highlights how international cooperation along with U.S. Coast Guard high endurance cutters can detect, monitor, and interdict high-seas drift net fishing vessels," said Capt. Gregory Sanial, 17th Coast Guard District chief of enforcement. "This method of fishing is illegal, despicable, and shows complete disregard for the world's ecosystem; and the joint effort of the many Pacific nations shows our dedication to ending this barbaric practice, enforcing maritime law and being good stewards of the environment."

"IUU fishing is one of the most serious threats to American fishing jobs and fishing communities as well as to the health of the world's oceans," said Jane Lubchenco, Ph.D., undersecretary of commerce for oceans and atmosphere and NOAA administrator. "This multi-national, multi-agency action and investigation demonstrates the resolve of the United States to work closely

with international partners to combat IUU fishing. We will continue this investigation to identify others who may be profiting from illegal activities."

As the only U.S. agency with the combination of a high seas ship and aircraft fleet, and the legal authority to project law enforcement presence throughout the 3,360,000 square mile U.S. Exclusive Economic Zone and in areas of the high seas vital to U.S. interests, the U.S. Coast Guard is the lead U.S. agency for at-sea enforcement of living marine resource laws in addition to providing maritime security and safety.

Schilling Robotics' receives new order from Republic of Korea Navy for the HD ROV

Schilling Robotics, LLC, experts in subsea systems, announced the order for two 150hp, 3,000m rated HD™ ROV systems from GMB USA, Inc. for delivery to the Republic of Korea (ROK) Navy. One system will be delivered for their Amphibious Submarine Rescue vessel and the second for their Auxiliary Towing Salvage vessel.

This order adds to the first HD purchased this year by the ROK Navy, reflecting the expansion of their salvage and rescue operations. The exceptional performance and configurability of the HD results in an ideal solution for their needs.

"We are very pleased that the ROK Navy has recognized that Schilling's HD vehicle is the most technically advanced in the world and has selected us to continue their expansion program," said Tyler Schilling, chief executive officer for Schilling Robotics.

The HD ROV provides increased reliability and availability through an integrated design philosophy for all major sub-systems. This drives a significant reduction in components, enables modular maintenance, and reduces major component replacement timeframes from potentially tens of hours to one hour or less. The HD ROV also provides industry-leading stability and position control accuracy to perform remote intervention activities.

GD get SMCM UUN contract

General Dynamics Advanced Informational Systems Inc., McLeansville, North Carolina, is being awarded a $48,606,916 contract with cost-plus-incentive-fee, cost-plus-fixed-fee, and firm-fixed-price line items for the engineering, manufacturing, and development of the Surface Mine Countermeasure Unmanned Underwater Vehicle (SMCM UUV). The SMCM UUV system will provide the fleet mine warfare commander with enhanced mine-hunting capability. The SMCM UUV system will address the Navy's need to reliably detect and identify undersea volume and bottom mines in high-clutter environments and areas with potential for mine case burial. The SMCM UUV will also gather environmental data to provide intelligence support for other mine warfare systems. SMCM UUV system will be a part of the Littoral Combat Ship MCM mission package. This contract will also contain an option for the production of up to five low-rate initial production systems. This contract includes options which, if exercised, would bring the cumulative value of the contract to $86,719,986. The contract will be initially funded with $10,119,000. Work and is expected to be completed by March 2016. The Naval Surface Warfare Center Panama City Division, Panama City Beach, Florida, is the contracting activity (N61331- 11-C-0017).

Key West Harbor Dredging Project Resource Monitoring

By Keith D. Spring, Senior Scientist, Erin Hodel, Staff Scientist, CSA International, Inc.

The U.S. Navy-sponsored maintenance dredging of the Key West Harbor Turning Basin, Main Ship Channel, and Truman Harbor (2004 to 2007) was the first dredging project undertaken within an existing U.S. National Marine Sanctuary. Due to the presence of sensitive marine resources (including seagrass, hard bottom communities, and coral reefs), the project required the development and implementation of a comprehensive monitoring program to prevent or minimize dredging-related impacts to these resources within the Florida Keys National Marine Sanctuary (FKNMS). The monitoring program was developed through cooperative efforts between State and Federal agencies and private contractors, including the U.S. Navy, U.S. Army Corps of Engineers (USACE), FKNMS, National Oceanographic and Atmospheric Administration (NOAA), Florida Department of Environmental Protection (FDEP), U.S. Environmental Protection Agency (USEPA), National Marine Fisheries Service (NMFS), CZR Inc., CSA International, Inc. (CSA), and PPB Environmental Labs, Inc. (PPB).

Environmental monitoring for the dredging project included physical and biological monitoring components conducted before, during, and after dredging. The program was initiated with resource characterization surveys to assess and document marine communities within and adjacent to the project area. Diver surveys also were conducted along the inner and outer edges of Truman Harbor as well as along isolated hard bottom outcrops protruding into the existing ship channel to assess the size and number of stony coral colonies that would be impacted by dredging in these areas. Nearly 900 stony corals were subsequently removed from these locations by CSA scientific staff, with most of the colonies reattached to adjacent reefs and hard bottom sites outside of the area of direct impacts. Following completion of the surveys, an Environmental Assessment document was prepared and a comprehensive monitoring program was developed by the Navy and implemented by CSA and PPB staff. The monitoring program had four primary components:

1. Operational Control Turbidity Monitoring (OCTM) measured turbidity associated with dredging, ensuring permit compliance and the protection of marine resources. Turbidity, temperature, and water current data were collected every 2 hours during dredge operations on a continuous 24 hour basis. This provided an early-warning system for the possibility of resource impacts due to increased turbidity and sedimentation. If turbidity was found to be higher than prescribed levels over background values (threshold level), dredging was required to shut down until the situation was remedied and the monitoring frequency was increased to 15 minutes until turbidity fell to background levels. Due to the frequency of turbidity measurements, any significant turbidity increases over threshold levels were noted almost immediately and corrective actions applied, meaning any dredge-related potential turbidity impacts were limited to less than 2 hr. before detection and corrective actions were taken. The successful implementation of OCTM allowed dredging to progress with a minimal number of excess turbidity shutdowns, resulting in major cost savings and decreased impacts to adjacent marine resources.

2. Resource Health and Sedimentation Monitoring (RHSM) was conducted to monitor sensitive marine resources adjacent to dredging operations to detect declines in coral or seagrass health as a result of increased turbidity, sedimentation, or direct physical contact from dredging-related vessels. It was hypothesized that if sufficiently frequent monitoring were conducted, any declines in resource health could be detected early, allowing for immediate corrective action and, ultimately, minimizing long-term resource impacts. Permanent RHSM sites were established outside of the ship channel along the project area footprint and in separate reference sites within hard bottom areas, on Hawk Channel patch reefs, on bank reefs, on the walls within Truman Harbor, and in shallow and deep seagrass beds (**Figure 1**). The surveys were conducted at weekly intervals at any monitoring sites positioned within 1,500m of dredging operations for the previous week. If significant turbidity increases were observed during the OCTM program, additional RHSM surveys at shorter intervals were conducted. Data included video and diver observations of tagged coral colony and seagrass bed health, sedimentation accumulation measurements, monthly sediment trap data collection, and drift dive observations along dredged areas of the channel. Weekly and monthly summary reports were submitted. Any indications of declines in coral or seagrass health at project area sites compared to reference sites, increased sedimentation above set thresholds, or potential impacts observed during drift dives that could be attributed to dredging actions were documented with video and reported to the Navy, resource agencies, and the dredging contractor and followed by immediate initiation of corrective measure implementation.

RHSM showed potential short-term impacts to corals along specific segments of the Key West Ship Channel. Monitoring of tagged coral colonies at project and reference sites did not, however, show adverse dredging impacts to corals. Most of these corals exhibited tissue paling at some point in the monitoring

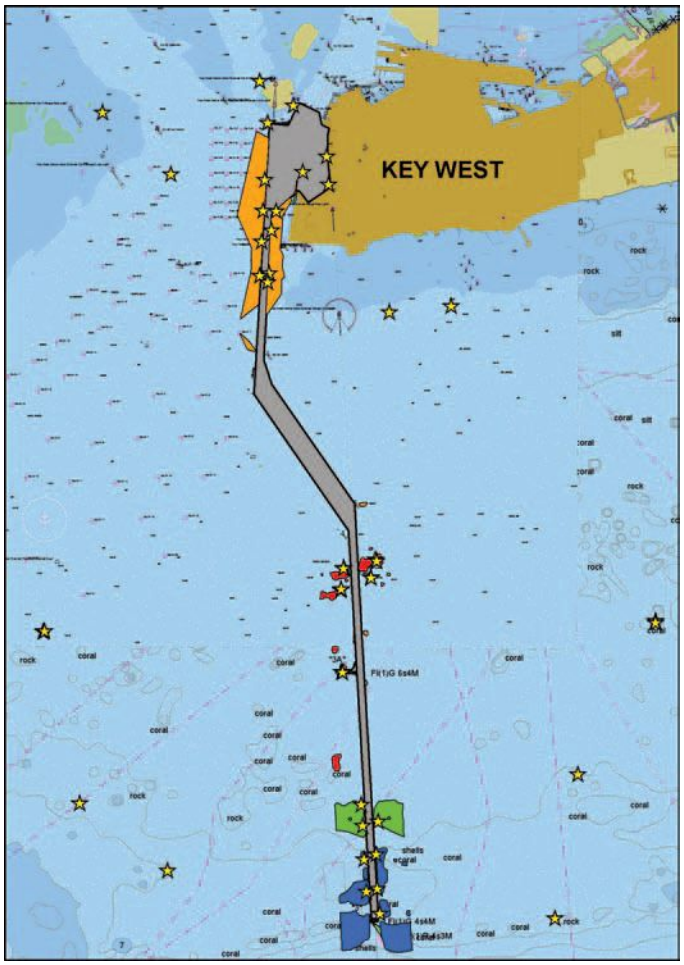


Figure 1 *Key West Harbor Dredging Project Area with monitoring station locations*

period, with a smaller subset showing tissue bleaching. Paling occurred in a much higher percentage of reference corals, while slightly more project corals exhibited bleaching. The majority of impacts were ultimately tied to sediment deposition as a result of numerous hurricane events during the dredging period. The drift dive surveys were useful in detecting direct physical impacts to channel-edge reefs and hard bottom communities caused by the dredge cutterhead working outside of the channel footprint. Several instances of the dredge operating slightly outside of the prescribed footprint were detected and immediately reported to the Navy and resource agencies, resulting in rapid damage response assessments and immediate restoration of coral resources damaged by operational accidents.

3. Resource Impact Assessment Monitoring (RIAM) was conducted to describe and quantify benthic marine communities adjacent to the dredging footprint and sediment placement site and to document possible dredging impacts to these communities. The surveys included collection of quantitative format digital video data along three 20-m long fixed repetitive transects established at each site within the coral and seagrass areas. The video data were analyzed to determine percent cover of stony corals, octocorals, sponges, algae, and seagrass, and statistical analyses were conducted to compare project and reference areas before and after dredging. Pre- and post-dredging images of tagged coral colonies from RHSM also were compared to assess changes in individual coral colony health and the amount of living tissue between surveys.

The results of RIAM indicated that major faunal groups, including sponges, octocorals, and stony corals, all decreased in percent cover at project and reference sites between the pre- and post-dredging surveys. However, very few statistically significant decreases in percent cover between project and reference site fauna were detected; for most of these, the percent faunal cover at the reference sites had decreased at a higher level than at the project sites. There were no project sites with statistically significant declines in stony coral percent cover relative to reference sites.

Approximately 20% of the tagged corals, from both project and reference sites, showed living tissue losses during the monitoring period. Significant declines in *Thalassia testudinum* percent cover were found at two of the shallow water seagrass monitoring sites adjacent to Fleming Key and at one reference site. This may have been due to increased sedimentation caused by tug and barge traffic to the Fleming Key disposal site.

Monthly sediment trap data analyses showed wide variations in the average daily sedimentation rate between monitoring sites and seasons, with large increases during winter storm events and up to 400 times the observed summer daily sedimentation rates following hurricane events. Sediment traps detected slight increases in sedimentation rates at several project area monitoring sites over a 2-month period early in the dredging project that may have been attributed to hopper dredging, while the sediment trap data showed no elevations in average daily sedimentation rates due to backhoe dredging.

4. Net Environmental Effects Monitoring (NEEM) was designed to monitor the net environmental effect of turbidity plumes from passing cruise ships before and after dredging. Turbidity plumes from cruise ships were a concern relative to potentially degrading the health of the corals living in the vicinity of the ship channel and harbor. A potential benefit of the dredging project was that it would remove loose sediments from the ship channel, and removal of source material for these plumes would reduce potential harm to corals. Turbidity monitoring suggested that some improvement may have occurred as a result of the deepening of the channel and removal of sediment from the channel. Factors that may have contributed to the improvement were the reduction in the quantity of loose sediment in the channel and an increase in the depth of the channel. Sediment trap data did not indicate that conditions of sediment re-suspension had improved; however, the data were sparse and the data collected before and after the dredging were not from the same season, which confounded interpretation.

Each of the monitoring components had a different purpose and was integrated to provide a complete program to detect and prevent or minimize dredging-related impacts to sensitive benthic marine resources of the Key West Harbor area. Caution should be used in making global statements about the lack of environmental impacts of channel and harbor dredging based on the results from this single project. Proper consideration should be given to the very conservative turbidity thresholds, specialized dredging equipment required to reduce turbidity and sedimentation, the predominantly coarse sediments within the project area, and the stringent monitoring and regulatory oversight due to the location within a National Marine Sanctuary. Even with all of these regulations, accidents and impacts occurred, though they were minimized.

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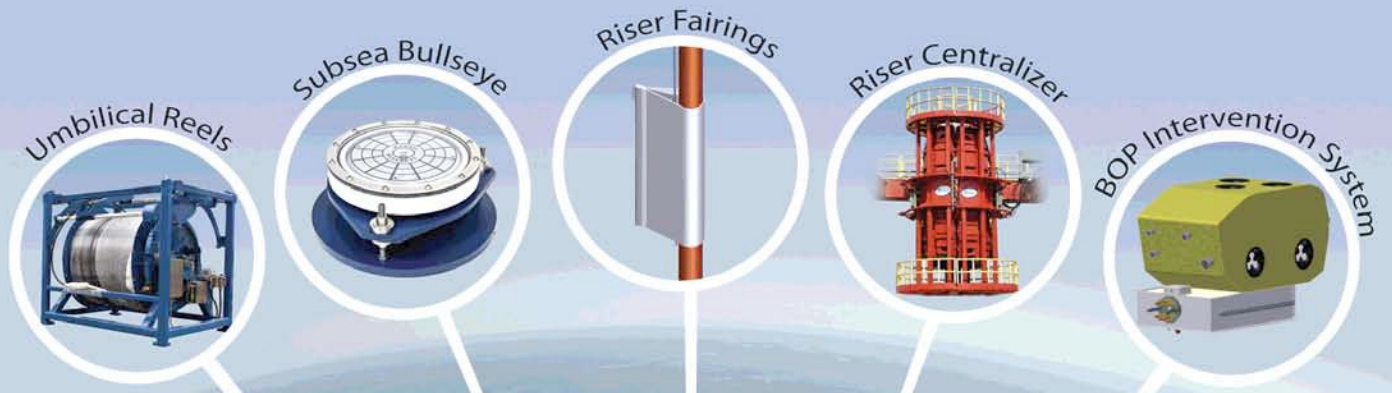

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OFFSHORE INDUSTRY

DNV warns the era of cheap oil is ending, requiring complex wells

A report compiled by Det Norske Veritas titled "Technology Outlook 2020" warns that the age of "cheap" oil is coming to an end. With a forecasted 19% increase in global energy demand by 2020, DNV believes the sector will have to push the boundaries to meet this need.

In the last 25 years, only one barrel of oil has been discovered for every four barrels consumed. Daily world oil consumption is about 85 MMbbl with production never expected to exceed 95 MMb/d. Therefore, companies will have to explore more costly, lower quality, and unconventional oil sources.

The industry will have to prepare itself for drilling more complex and demanding wells in deepwater, complex reservoirs, and the Arctic, which poses a number of technology challenges to oil and gas development. Operation is anticipated to reach pressures above 20,000 psi and temperatures of more than 200° C by 2020, and technology will have to adapt to withstand and work efficiently in these parameters, according to the report.

Drilling operations will also become more efficient in mature fields to enable development of smaller reservoirs and increase oil recovery in existing fields.

U.S. wants to regulate contractors of offshore oil companies

U.S. authorities are looking to regulate the contractors of oil companies that work offshore in the wake of the Gulf of Mexico oil spill, a senior federal official said in early October.

"We will regulate contractors as well as operators. There is no compelling reason or logic not to do so," Michael Bromwich, director of the U.S. Bureau of Ocean Energy Management, Regulation and Enforcement, told an oil conference.

The agency is responsible for overseeing the development of energy and mineral resources off the coast of the United States as the successor of the much criticized Minerals Management Service.

During last year's BP oil spill in the Gulf of Mexico, the role of contractors Halliburton, in charge of the cementing in the Macondo well, and Transocean, which operated the Deepwater Horizon rig, came into sharp focus in addition to the role the BP played as operator. Under current practice, U.S. regulators turn mainly to the operator as the company accountable for all offshore operations.

"There is a virtue in the administrative clarity in going only against the operators and not confusing the picture," Bromwich told reporters after his speech.

No oil leaking from Transocean rig or riser, investigation confirms

A comprehensive two-day underwater examination conducted by Transocean and the U.S. Coast Guard (USCG) on 4-5 October confirmed that there are no hydrocarbons leaking from the sunken Deepwater Horizon or the riser, the pipe that linked the rig to the well head before the Macondo accident last year.

The inspection, conducted with the use of an ROV, also failed to find any sheen" or oil in the area.

Transocean, in cooperation with the USCG, undertook the inspection after a "sheen" was reported on the water in the vicinity of the sealed Macondo well and the USCG issued a notice to the company.

And, recent BP ROV footage of the capped Macondo 252 well from 26 to 27 August 2011, has shown no evidence of a release from the wellhead or well. The cause of the sheens remains under investigation.

Shell chairman: floating LNG is a game changer for offshore gas

Royal Dutch Shell's new technology to produce liquefied natural gas aboard floating vessels will prove to be a game changer for the offshore gas (LNG) industry, Chairman Jorma Ollila.

"This game-changing technology will substantially reduce the cost and environmental footprint of developing offshore gas fields," Ollila said at the International Energy Agency's Ministerial Meeting in Paris.

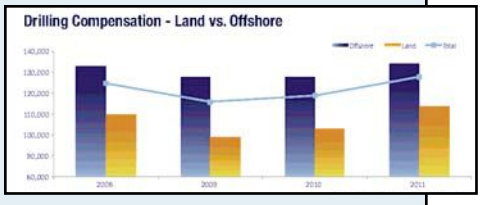
"There is no need for long pipelines, for platforms to pump the gas to shore, for dredging, jetty construction or onshore development," all of which add costs to gas projects, he said.

Shell plans to use the first floating LNG plant to develop the Prelude gas fields 200km off the coast of Australia.

Drilling salaries trend higher In 2011 amid rising stability: Rigzone study

Industry is now seeing wage increases across the oil and gas sector, especially for jobs that fall under the functional profession of drilling, according to a Rigzone study.

Following a precipitous drop in 2008 and a subsequent trough marking the height of the global recession in 2009, global rig counts have surged in tandem with energy prices. Rig counts globally are approaching levels last seen at the 2008 peak. However, the Gulf of Mexico and the North Sea are two regions not currently participating in this uptrend.



When looking at the broader picture, overall compensation levels suffered last year where offshore rig counts were weakest. In North America, the blowout in the Gulf of Mexico overshadowed a rebirth in land drilling ushered in by E&P firms expanding their efforts to drill the various shale plays in both the United States and Canada. Western Europe's decline, which is predominantly offshore drilling activities, also can be explained by a lack of improvement in North Sea drilling last year.

Still, the upward trend has continued this year. Surveyed salaries for 2011 within Rigzone's Compensation Tracker are up 8% – or $9,000 – to $128,000 overall for the drilling industry. This is a steeper trajectory than 2010, when drilling industry wages grew by 2.5%.

While both land and offshore drilling are showing stronger performances year-to-date, the growth of compensation for drillers with land expertise has improved at a faster pace. The high demand for crews to operate unconventional land rigs (i.e. horizontal/directional drilling) in shale plays is the catalyst.

CEO: ExxonMobil to invest over $37B on capital projects this year

ExxonMobil Corp. chief executive officer Rex Tillerson said the company expects to spend a record $37 billion on capital projects in 2011, almost 9% more than it has previously said it was planning to invest.

ExxonMobil, the world's largest publicly traded oil company by market value, in March said it expected to invest about $34 billion this year and between $33 billion and $37 billion annually through 2015.

The head of Exxon Mobil said the global economy is likely to continue growing but at a slower pace than previously anticipated.

BP recovers $4B from Anadarko Petroleum for Gulf of Mexico spill

BP said that E&P independent Anadarko Petroleum, a partner in a well that exploded in the Gulf of Mexico, agreed to pay $4 billion to settle claims relating to last year's massive oil spill. The settlement ends a long dispute between BP, which operated the Macondo well, and Anadarko, which owned a 25% stake, about accepting responsibility for compensating those affected by the spill.

The settlement was not an admission of liability, said BP, whose investigation concluded that the accident was the result of multiple miscues involving several companies. BP continued to argue with its contractors, Transocean, which operated the rig, and Halliburton, which was responsible for cement work, about participating in the compensation payments.

Shell may build pipeline as market outlet for deepwater production

Shell Pipeline Co. said it is considering building a new pipeline, one designed to move crude from St. James, Louisiana, to the refining hub around Beaumont and Port Arthur, Texas, a project known as Westward Ho. The project is designed to find a market outlet for increases in production from the Gulf of Mexico's deep waters. It would complement infrastructure being built in St. James and Clovelly, Louisiana.

The Westward Ho investment will largely depend upon a favorable response to Shell Pipeline's plans to reverse the Houma-to-Houston pipeline.

The new pipeline would allow for the distribution of about 900,000 barrels per day of crude. It could begin service by early 2015.

Australia okays huge LNG project with 70 environmental conditions

Chevron has won Australian government approval for its multi-billion dollar Wheatstone liquefied natural gas (LNG) project, but with strict environmental conditions. The nod clears one of the final hurdles before construction of the plant, which will consist of two processing units with a combined capacity of 8.9 million metric tons of LNG a year. It is scheduled to start production in 2016.

Environment Minister Tony Burke said 70 conditions would apply to the project, off Western Australia's Pilbara region. They were intended to help protect threatened and migratory species such as dugongs, marine turtles, sawfish, dolphins and whales, as well as the general marine environment.

"Chevron will be required to submit for my approval a range of plans and programs detailing how the project impacts on protected matters will be minimized," Burke said. Wheatstone is a joint venture between Chevron (73.6%), Apache (13%), Kuwait Foreign Petroleum Exploration Co. (7%), and Royal Dutch Shell (6.4%).

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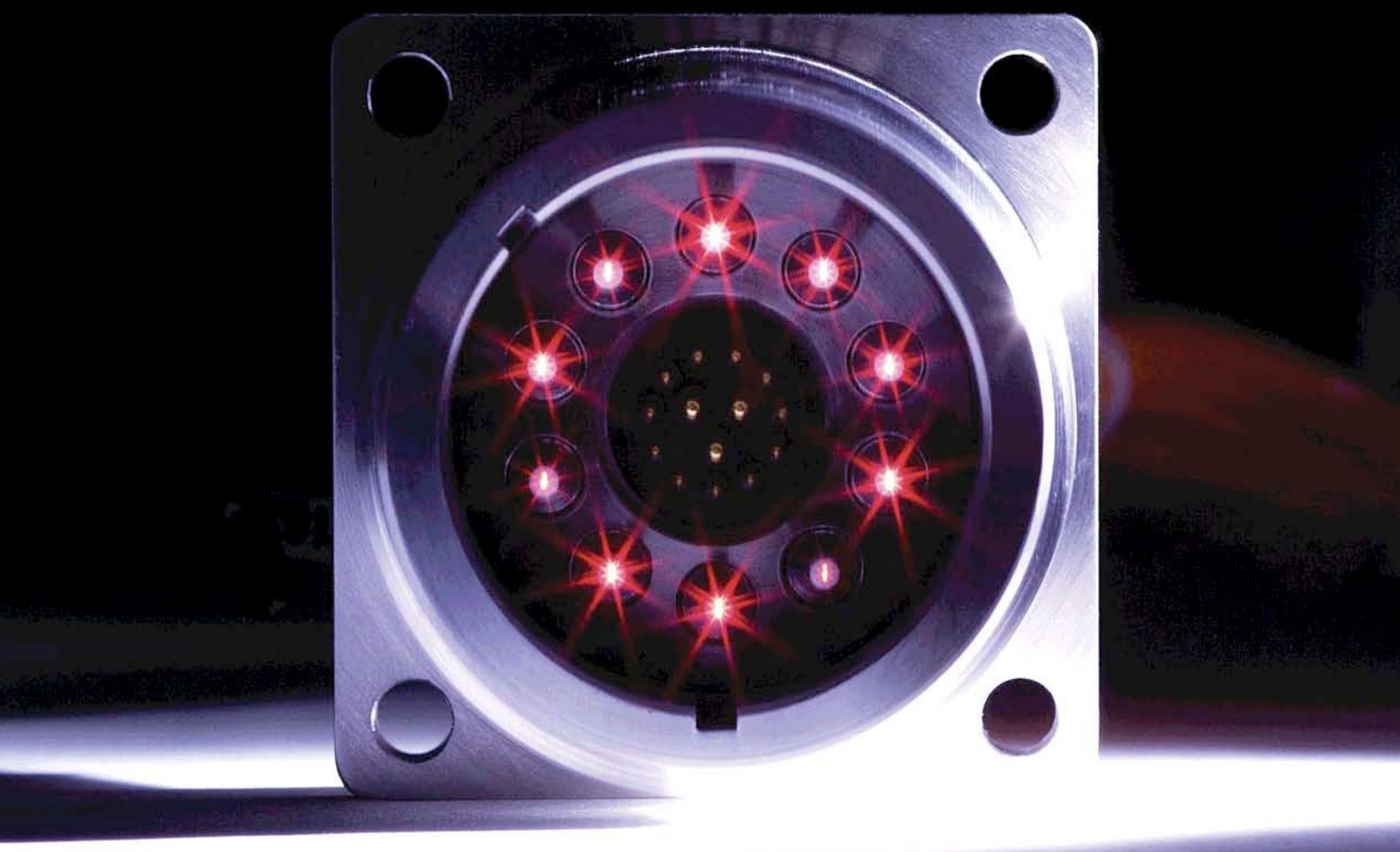

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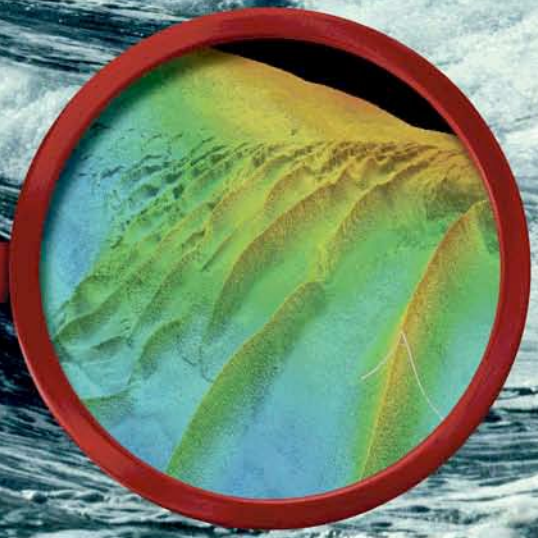

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Teekay agrees to acquire three FPSO units from Sevan Marine ASA

Teekay Corp. has reached an agreement in principle to acquire three floating production storage and offloading (FPSO) units from Sevan Marine ASA, a Norway-based developer, owner and operator of FPSO units, and acquire an equity interest in a recapitalized Sevan.

Under the terms of the agreement, which was approved by the Teekay and Sevan boards of directors, Teekay will acquire from Sevan FPSO units Hummingbird, Piranema, and Voyageur (upon completion of upgrade), along with their existing charter contracts; finance the completion of the Voyageur FPSO upgrade; subscribe to a new issuance of Sevan equity to acquire a significant ownership position in a recapitalized Sevan; and enter into a cooperation agreement to acquire future FPSO projects developed by Sevan.

"Our investment reflects our confidence in Sevan's strong offshore project development expertise while providing Teekay with an enhanced pipeline of future on-the-water FPSO growth opportunities," said Peter Evensen, Teekay's president and chief executive officer.

"Although the negotiation process has been complex, with many moving parts and counterparts, this is an important transaction for the FPSO industry and represents a rare opportunity to combine the bench strength of two leading specialty FPSO solution providers. The proprietary Sevan cylindrical hull is widely regarded as a safe, highly versatile, and flexible design that can be readily deployed in harsh or benign waters at water depths of up to 3,000m."

The FPSO unit Sevan Voyageur

He said that coupled with Teekay's operational capabilities and balance sheet strength, Sevan's engineering and offshore design capabilities and intellectual property represent a powerful FPSO project development combination.

Teekay reached the agreement in principle for its participation in a consensual restructuring of Sevan's capital structure following discussions with Sevan's board of directors, some of its largest shareholders, and a group of bondholders holding a majority of each of Sevan's bond classes. The transaction remains subject to finalizing details and agreement of definitive documentation, in addition to formal approval by the bondholders in each of Sevan's bond classes, the approval from Sevan's shareholders, consent from Sevan FPSO charterers, and approvals by regulatory authorities.

Drilling activity remains low on UK Continental Shelf in Q3

North Sea offshore drilling activity rose 45% from the second to the third quarter of 2011, but the overall trend continues to fall, according to the latest oil and gas industry figures released by Deloitte.

The North West Europe Review, which documents drilling and licensing on the UK Continental Shelf (UKCS), reveals that while 16 exploration and appraisal wells were spudded between 1 July and 30 September compared to just 11 in the second quarter, this is still 36% fewer than during the same period last year. This brought the total number of wells drilled so far in 2011 to 37, a 41% decrease on the same period last year and the lowest number drilled in this period since 2003.

Deloitte's petroleum services group said this trend is not what would be expected during a period when the average oil price is over $100 per barrel.

Petrobras confirms new ultra-deep oil province offshore Brazil

Petrobras says its has discovered a new ultra-deepwater oil province in Brazil's Segipe-Alagoas basin. Well 1-BRSA-851-SES (1-SES-158), otherwise known as Barra, was drilled in the block SEAL-M-426 in a water depth of 7,680 ft., 36 miles off the coast of the state of Sergipe and 56 miles from Aracaju. The discovery of oil and gas was confirmed following wireline logging and fluid sampling from a lined well formation test.

Petrobras said high-quality porosity conditions were encountered in reservoirs at subsurface depths between 16,568 to 17,716 ft. An oil sample indicated excellent quality, with API of around 43 degrees in the upper interval and 32 degrees in the lower interval.

FMC awarded $135M subsea equipment contract
FMC Technologies, Inc. was awarded a contract by BG Norge, a subsidiary of BG Group, for the manufacture and supply of subsea production equipment to support the Knarr oil and gas field. The contract has a value of approximately $135 million in revenue to FMC Technologies. The Knarr field, formerly known as Jordbaer, is located in Norwegian block 34/3 of the North Sea in water depths of about 1,320 feet. FMC's scope of supply includes three each of subsea production trees and water injection trees. The company will also provide six subsea control modules, five wellheads, two manifolds, and other related equipment and controls. Deliveries will commence in the spring of 2013.

Subsea 7 wins contract for Petronas in Malaysia
Subsea 7 Malaysia Sdn Bhd was awarded the Kumang Cluster Project by Petronas Carigali. The project involves the transportation and installation of subsea structures, 5km of umbilical cable, pipeline jumpers, and electrical flying leads, including the pre-commissioning of an existing 24-inch, 5km pipeline and new umbilical in the Kumang Field. The workscope comprises project management and engineering associated with the installation of the subsea equipment. A combined team from Subsea 7 and Petronas will deliver the project, enabling greater development and understanding of deepwater technologies and allow most operations to be completed utilizing diverless intervention techniques. The project is to be completed in two phases.

KBR gets Hod Re-Development pre-FEED
BP Norge AS has contracted KBR to do a pre-front-end engineering and design study for the Hod Re-Development Project in the North Sea. KBR will include engineering services for development of a replacement wellhead platform for the Norwegian sector of the North Sea, and the pre-FEED will lead to a decision on whether to go to the definition stage of the re-development program. KBR will be operating on behalf of BP and Hess Norge AS on the pre-FEED and has been awarded as a call off against BP's offshore engineering and project management services global agreement with KBR.

GE's technology to help OGX development
GE Oil & Gas was awarded a major contract from OGX Petróleo e Gás Ltda. to supply drilling and production equipment for three offshore fixed production platforms to be deployed in the Waimea and Waikiki oil and gas fields of the Campos Basin, offshore Brazil, where OGX plans to drill a significant number of production wells over the next four years. With a total potential estimated value of $230 million over the next four years, of which $32 million on formal orders has been already signed and booked, this is the largest contract ever signed between GE Oil & Gas and OGX and the first one involving the supply of equipment specifically for development projects already in the production phase.

Apache vastly expands North Sea position with $1.75B ExxonMobil deal

The Beryl Alpha platform in the North Sea

Apache Corp., through its subsidiary Apache North Sea Ltd., has agreed to acquire ExxonMobil Corp.'s Mobil North Sea LLC assets, including the Beryl field and related properties, for $1.75 billion. The fields have current net production of approximately 19,000 barrels of oil and natural gas liquids and 58 million cubic feet (MMcf) of natural gas per day. At year-end 2010, estimated proved reserves totaled 68 MMboe.

The transaction, with a planned close at year-end 2011, is expected to increase Apache's North Sea production by 54% and proved reserves by 44%. The assets to be acquired include operated interests in the Beryl, Nevis, Ness, Nevis South, Skene, and Buckland fields; operated interest in the Beryl-Brae gas pipeline and the SAGE gas plant; non-operated interests in the Maclure, Scott, and Telford fields; and Benbecula (west of Shetlands) exploration acreage.

Steve Farris

"These major legacy assets will expand Apache's presence in the North Sea. They bring us significant remaining life, high production efficiency, and quality reservoirs – the best North Sea assets we've evaluated since acquiring the Forties Field in 2003," said Steve Farris, Apache's chairman and chief executive officer. "There is a portfolio of low-risk exploitation projects, and we believe the complex structural setting holds reserve upside."

He added: "Over the past 8 years, Apache has demonstrated the ability to increase the efficiency of mature North Sea assets, find new reserves to extend field life, and operate in a safe and environmentally responsible manner."

Since acquiring the Forties Field, Apache has drilled about 100 development wells, invested $3.2 billion, produced approximately 161 MMboe – more than the proved reserves at the time of the acquisition – and added an estimated 171 MMboe in new reserves. Second-quarter 2011 net production from Forties averaged 56,985 bbl/d, up from about 33,000 bbl/d in the second quarter of 2003, after Apache assumed operations.

The transaction is subject to regulatory approvals and preferential rights. Apache intends to finance the acquisition with cash.

Hess Corp. to develop Tubular Bells field in the Gulf of Mexico

Hess Corp. intends to proceed with the development of Tubular Bells, a deepwater oil and gas project operated by Hess in the U.S. Gulf of Mexico.

Discovered in 2003, Tubular Bells is located about 135 miles southeast of New Orleans in the Mississippi Canyon area. The field lies in water depths ranging from 4,300 to 4,600 ft. The plan initially calls for three subsea production wells and two water injection wells from two subsea drill centers tied back to a third-party owned spar production facility, the first of its kind to be constructed entirely in the United States.

Annual gross production is expected to peak in the range of 40,000 to 45,000 boe/d. Total estimated recoverable resources for Tubular Bells are estimated at more than 120 MMboe. The development is estimated to cost $2.3 billion, with additional commitments for production handling, export pipeline, and oil and gas gathering and processing services.

Drilling is scheduled to begin in 2012 ,and initial production is expected in 2014, Hess said.

The drilling rig Ocean Yorktown

Fairmount Alpine delivers rig Ocean Yorktown to Gulf of Mexico

Fairmount Marine's tug Fairmount Alpine has delivered the semi-submersible drilling rig Ocean Yorktown safely in Brownsville, Texas, after a 5,400 miles tow from Rio de Janeiro, Brazil.

Fairmount Marine was contracted in July by Diamond Offshore, a leading deepwater drilling contractor headquartered in Houston, to tow the semi-submersible drilling rig Ocean Yorktown to the Gulf of Mexico region.

At that moment Fairmount Alpine just finished a special survey in Durban, South Africa. The tug was instructed to mobilize towards Ro de Janeiro.

Upon arrival in Rio de Janeiro, Fairmount Alpine assisted the Ocean Yorktown in the field until the rig was ready to commence the voyage to Brownsville. Fairmount Alpine successfully towed the Ocean Yorktown in just 34 days, with an average speed of 6.6 knots, including a 2-day bunker stop.

Technip subsidiary awarded umbilical contracts in the U.S.

Technip wholly-owned subsidiary DUCO Inc. was awarded two contracts by Shell Offshore Inc., for the Cardamom and West Boreas field developments located in the Gulf of Mexico. The contracts include the engineering, project management and construction of a 9,265m umbilical for Cardamom and a 6,096m umbilical for West Boreas.

The umbilical systems will be manufactured by Duco in its facility in Channelview, Houston and are scheduled for delivery in 2012. The award follows the recent delivery of the umbilical systems for Shell's Perdido development, which are the deepest installed umbilicals in the world at approximately 2,950m water depth.

Ensco inks U.S. Gulf of Mexico rig contract with three producers

Noble Energy Inc., Anadarko Petroleum Corp., and an Apache Corp. unit will use one of drilling contractor Ensco plc's ultra-deepwater semi-submersible drilling rigs in the Gulf of Mexico. The shared drilling contract for ENSCO 8505 is for two years, or two rotations per operator, whichever is longer, Ensco said.

The daily rate for the rig will be $475,000, plus cost adjustments, adding about $350 million to Ensco's revenue backlog. ENSCO 8505 will be delivered from the Keppel FELS Ltd shipyard in Singapore in the first quarter of 2012.

After imposing a ban on new offshore drilling in the U.S. Gulf after last year's oil spill, U.S. regulators have approved new drilling plans for companies like Royal Dutch Shell and Chevron.

Keppel AmFELS delivers fourth EXL jack-up rig to Rowan Cos.

Keppel AmFELS has completed the delivery of its fourth EXL jack-up rig to a subsidiary of Rowan Companies, Inc. four months ahead of schedule and within budget. The jack-up rig was christened Rowan EXL-IV and was scheduled to depart Keppel AmFELS' yard in Brownsville, Texas in October 2011. The ABS-classed EXL jack-up design is an enhancement of the LeTourneau Super 116E model. With a leg length of 477 ft. and hook load capacity of up to 2 million lb., the EXL-IV employs state-of-the-art technology to drill high-pressure, high-temperature and extended-reach wells worldwide. The rig is capable of drilling to a depth of 40,000 ft.

EXL jack-up rig

Northern Offshore receives letter of award for Energy Driller rig

Northern Offshore Ltd. received a letter of award from Oil and Natural Gas Corp. for its semi-submersible Energy Driller for work offshore India.

The term of the contract is for three years, with initial operations commencing off the west coast during the first quarter of 2012. The Energy Driller completed its previous three-year contract with ONGC on 31 August 2011 and was subsequently demobilized to a Singapore shipyard, arriving 20 September 2011.

While in the shipyard, the rig will undergo Class inspections and maintenance in preparation for the new contract. The estimated contract value for the award is approximately $230 million.

Seadrill contracts two deepwater drilling rigs still under construction

Seadrill has found work for two new ultra-deepwater newbuild semi-submersible drilling rigs. The West Capricorn has a firm 5-year contract to work in North America with a potential value of $919 million. The unnamed oil company can extend the agreement for two added 1-year periods. The rig is under construction at Jurong Shipyard, Singapore and scheduled for delivery late this year. Seadrill says the rig will be the first ultra-deepwater unit in the industry outfitted with a seven-ram blowout preventer. The West Leo semi-submersible drilling rig, also under construction at Jurong and scheduled for delivery in January 2012, has a one-year contract with Tullow Oil Ghana Ltd. (West Leo is a Moss Maritime CS50 Mk II design).

EMAS production achieves first oil in Vietnam with FPSO Lewek EMAS

EMAS, a leading global offshore contractor and provider of integrated offshore solutions to the oil and gas industry, said that Lewek EMAS, the floating production, storage and offloading (FPSO) for Vietnam's high-profile Chim Sao oil project, successfully achieved first oil on 10 October 2011.

The vessel is EMAS Production's latest and largest FPSO vessel. This milestone marks the commencement of the vessel's $1 billion charter contract with Premier Oil Vietnam Offshore B.V. The contract, which was one of a handful of FPSO contracts awarded globally in 2009, comprises a primary term of 6 years, with 6 renewable 1-year extension options.

Lionel Lee, EMAS's managing director, said, "The Group was able to provide an integrated solution from the provision of the FPSO through EMAS Production and the fabrication of modules at TRIYARDS in Vietnam, to the installation and commissioning of the vessel. This demonstrates how EMAS aims to serve clients globally across the entire life-of-field."

Lewek EMAS, which underwent conversion in Singapore's Keppel Shipyard from a 168,000 deadweight ton Suezmax oil tanker, has a storage capacity of about 660,000 bbl and can produce up to 50,000 bbl/d.

Lewek EMAS at Chim Sao Field, Vietnam (Photo: Business Wire)

The day-to-day operations and maintenance, during the contract period, is being undertaken by PV Trans EMAS Co. Ltd., a newly-incorporated Vietnamese joint venture company owned by PetroVietnam Transportation Corp. and EOC Ltd.

North Sea giant could dominate Norwegian oil production

Wood Mackenzie believes the value of the Aldous/Avaldsnes discovery in the Norwegian North Sea could potentially reach $13 billion, according to Offshore magazine.

Geoff Gillies, North West Europe lead analyst, said, "At the upper end of current expectations and based on currently commercial fields, the field could account for 20% of Norwegian oil supply from 2020, rising to over half by 2027, making a vital contribution to Norway's long-term oil production."

"This would rank it as the third largest Norwegian oil discovery of all time, and the seventh largest find in the history of the North Sea."

"With the recoverable reserves estimate now ranging from 1.2 to 2.6 Bboe, the field could be worth between $6.7 billion and $13 billion."

Recent appraisal drilling, he added, "not only proves the continuous geological structure across licenses PL265 and PL501, operated by Statoil and Lundin respectively, it also indicates higher porosity, higher oil saturation, and a net to gross ratio of close to 100%."

A unitization agreement still has to be established since the field straddles two licenses involving different co-venturers, but Gillies said it is a positive sign that the two operators have already formed a joint team to undertake conceptual development studies.

EIA: bolstered by shale plays, U.S gas a rising tide, up 1 Tcf in 2010

U.S. domestic natural gas production, bolstered by shale plays, continued a 5-year upward trend, increasing by nearly 5% in 2010 over the level in 2009, almost matching a nearly 6% hike in demand. Gas production was bolstered by a nearly 30% jump in shale play output, according to statistics published in the Energy Information Administration's (EIA) Annual Energy Review for 2010. Continuing a steady upward trend, U.S. natural gas production has risen by 20% over the last 5 years, from 18.051 Tcf in 2005. Consumption rose to 24.13 Tcf in 2010 from 22.84 the previous year, EIA estimated, led by a 7% rise in power generation demand to 7.38 Tcf from 6.87 Tcf. Industrial demand was up slightly to 7.93 Tcf from 7.44 Tcf in 2009. Residential and commercial demand was up 3% to 8.16 Tcf in 2010. The agency pegged total dry gas production at 21.58 Tcf in 2010, up 1 Tcf from 20.58 Tcf in the previous year. Marketed production also was up about 1 Tcf, to 22.57 Tcf in 2010.

Cairn strikes first ever discovery off Sri Lanka; more drilling required

Cairn Lanka, a subsidiary of Cairn India, has discovered gas with its first deepwater well offshore Sri Lanka. The CLPLDorado-91H/1z well was drilled in 4,442 ft. water depth in block SL 2007-01-001 in the Mannar basin. It encountered a gross 82-ft. hydrocarbon column in sandstones in subsurface depths between 9,986 to 10,068 ft.

MD has been interpreted from log and MDT data to be chiefly gas-bearing with additional liquid hydrocarbon potential. Further drilling will be needed to establish commerciality. This was the first well drilled in Sri Lanka for 30 years and the first to discover hydrocarbons in the country, according to Cairn Lanka.

Shell confirms new oil discovery offshore French Guiana

Shell has confirmed an oil discovery from well GM-ES-1 in the Guyane Maritime permit offshore French Guiana. The well is being drilled in a water depth of 2,000m and has encountered 70m of net oil play in two objectives.

The Tullow-operated joint venture is owned by Tullow with a 45% stake, Shell with 27.5%, Total with 25%, and Northpet with 2.5%.

Romanian Black Sea deepwater well possible by year-end

Petrom has confirmed it will enter a new exploration phase for the Neptune block in the Black Sea. This follows the Romanian government's decision to amend the concession agreement to extend the time allowed for exploration of the block. To maximize the chance of a commercially viable discovery, Petrom said, it is important to have sufficient time to thoroughly explore the block.

Petrom's work program in partnership with ExxonMobil includes drilling of the first deepwater exploration well in the Romanian sector of the Black Sea by the end of this year or into 2012.

"We have to take into account the fact that the Romanian deepwater area of the Black Sea is unexplored and deepwater exploration activities carry a high investment risk. Generally, deepwater exploration and development costs are many times higher than onshore," said Johann Pleininger, responsible for Exploration and Production.

Petrom and ExxonMobil Exploration and Production Romania signed a farm-out agreement in 2008 under which ExxonMobil acquired a 50% interest in the Neptune block. The two companies have since acquired 3D seismic.

Total acquires offshore blocks in Indonesia from Talisman Energy

Total has signed agreements with Talisman Energy to farm-in three deepwater offshore exploration blocks operated by Talisman in the Makassar Strait of Indonesia.

Under the agreement, Total acquired a 50% interest in the Sageri production sharing contract (PSC), 35% in the South Sageri PSC, and a 20% interest in the Sadang PSC.

The blocks are located in the South Makassar Basin at a depth of 400 to 2,000m, covering an area of 10,693 sq.km.

Total will undertake 2D and 3D seismic surveys and drill two exploration wells, the first of which will take place in the Sageri block at the end of 2011.

Ratio, Isramco discover gas on Med Yavne prospect offshore Israel

Ratio Oil Exploration and Isramco Negev 2 reportedly discovered natural gas in their Or 1 well in the Med Yavne prospect offshore Israel. The well, which is located in the Or 1 license, intersected gas-bearing sands in the Pliocene Yafo formation at a depth of 2,020m.

The companies said that the well results provided a best estimate of 42.4 bcf of natural gas with a 50% probability.

Ratio Oil Exploration holds a 12.3% stake, while Isramco and its affiliates own a 62% interest, Israel Petrochemical Enterprises and Dor Chemicals and its affiliate Dor Gas Exploration own 5.5% and 5.4%, respectively.

Rosneft, ExxonMobil to begin seismic exploration of Arctic

Russian oil major Rosneft and U.S. energy giant ExxonMobil will begin seismic surveying of the East Prinovozemelsky Blocks on Russia's Arctic shelf in two years, Rosneft head Eduard Khudainatov said recently.

Rosneft and ExxonMobil recently signed a $3.2 billion agreement to explore East Prinovozemelsky 1, 2, and 3 in the Kara Sea and the Tuapse License block in the Black Sea. Rosneft will hold 66.7% in both joint ventures.

The pact gives ExxonMobil, which is already partnering with Rosneft on the Sakhalin-1 offshore project in Russia's Far East, access to substantial reserves in Russia.

Interior approves first BP drilling plan for GoM since 2010 oil spill

The U.S. Interior Department has taken a major step toward allowing BP to resume deepwater drilling in the U.S. Gulf of Mexico by approving a revised exploration plan for up to four wells.

Interior's Bureau of Ocean Energy Management (BOEM) emphasized that BP will be held to beefed-up safety standards imposed on drillers after last year's huge spill and BP's July pledge to meet additional voluntary standards.

The plan proposes to drill up to four wells on Keathley Canyon blocks 292 and 336, which BP acquired in lease sales in 1997 and 2003.

BP operated the Macando well, which ruptured causing the largest oil spill in U.S. Gulf history.

An exploration plan describes all exploration activities planned by an operator on a specific lease or leases, including the anticipated timing of these activities, information concerning drilling vessels, the location of each planned well, and other relevant information. The water depth at the proposed well sites range from 6,019 to 6,034 ft. and are located 192 miles from Louisiana.

The M/V Sanco Spirit

TGS, PGS start multi-client 2D survey in Labrador Sea

Geoscience data provider TGS, in partner ship with Petroleum Geo-Services (PGS),launched a new 22,000km multi-client 2D survey in the Labrador Sea, offshore the Canadian province of Newfoundland. The survey was being carried out to the north of oil discoveries Hibernia, Hebron, Terra Nova, and White Rose and covers areas nominated in the Newfoundland and Labrador Offshore Petroleum Board's call for bids.

TGS is using M/V Sanco Spirit and PGS's GeoStreamer technology to acquire the data, which was to continue through the third quarter of 2011. The survey is supported by industrial funding, and initial data were to be available to clients during the fourth quarter of this year.

Chevron says it plans to drill off South China coast by year-end

Chevron Corp. was to begin drilling its first gas exploration well off the southern coast of China before the end of the year, near an area where large gas reserves have been found, a senior regional executive said, according to Dow Jones Newswires.

The well site, in block 42/05, is about 300km south of Hong Kong. Chevron also plans to drill wells in two other blocks further west, 64-18 and 53-30, around 125km south of China's Hainan island, Chevron Asia South managing director Joseph Geagea told Dow Jones Newswires.

Chevron is following the path of Husky Energy Inc. and BG Group plc, who both have found gas offshore southern China recently, demonstrating that the area contains potentially world-class reserves of hydrocarbons.

Four major oil companies join in $7.1B North Sea field investment

Four oil companies have won British government approval for a $7.1 billion investment in developing a major oil field in the North Sea. BP, Shell, ConocoPhillips, and Chevron are partners in the plan to install two new bridge-linked platforms in the Clair field, west of the Shetland Islands.

BP said that production from the new platforms is planned to begin in 2016 and continue for 40 years. The twin units would have a peak capacity of 120,000 bbl/d.

BP has a 28.6% stake in the venture, Shell has 28%, ConocoPhillips has 24% and Chevron has 19.4%.

Cameron to provide subsea equipment for Jette development

Cameron has signed an agreement with Det Norske for the supply of subsea production systems for the Jette development located in blocks 25/7 and 25/8 in the Norwegian sector of the North Sea.

The scope of supply for this fast track development includes wellheads, trees, flow bases, electro-hydraulic multiplexed controls, connections, pipeline end manifolds, and other associated subsea equipment. Deliveries are scheduled to commence in early 2012 and will represent $56 million in revenue to Cameron.

"Cameron is working in close alignment with Det Norske in executing this project. The project is groundbreaking for Det Norske as it is their first field development as operator, and for Cameron as it represents our first full subsea system supply in the Norwegian sector of the North Sea," said Jack Moore, chairman and chief executive officer of Cameron.

Saipem to manage Russia's first subsea development project

Saipem will perform subsea installations for the Kirinskoye gas condensate field offshore eastern Russia.

The contract was awarded by Mezhregiontruboprovostroy (MRTS) for Gazprom Dobycha Shelf as part of the Sakhalin 3 project.

Kirinskoye is in a water depth of up to 29 ft. in the sea of Okhotsk, 17 miles off the east coast of Sakhalin Island, and is the first subsea development of this type anywhere in Russia.

Saipem's scope includes engineering, procurement, fabrication, and installation of subsea structure; connections to subsea wells; and installation of infield umbilicals and the shore approach to the main inland as well as survey activities on the field. The company's yard in Karimun will handle fabrication.

BPZ opts for buoyant tower for Corvina oil development off Peru

BPZ Energy has issued contracts for fabrication, mobilization, and installation of a second platform at the Corvina field in block Z-1 offshore Peru. The company estimates the total cost of the new CX-15 platform, including all production and compression equipment, at $60 million. Installation off Peru should take place by end-July 2012 with first production expected during the 2012 fourth quarter.

CX-15 will be a buoyant tower with 12,200 bbl/d of oil production capacity; gas compression capacity of 12.8 MMcf/d; and produced water handling and injection capacity of 3,500 bbl/d. The tower will comprise four cylindrical cells and will be connected to the seabed by a single suction pile integral to the hull structure. It will have 24 drilling slots, some of which will be used for gas and water re-injection wells.

OFFSHORE LIGHT TOWER

Gulf Engine Receives US Patent for Offshore Light Tower Design

Gulf Engine / Les Palmisano, Jr. have been awarded U.S. Patent 7,988,343 for its "Offshore Light Tower" design. This innovative compact equipment design allows for safe and secure transportation of a portable vertical light tower. The unique features ensure this equipment design will be delivered to offshore work locations without damage to lighting or other fragile components. Gulf Engine continues to be a leader in the design, fabrication and assembly of quality offshore rental equipment.

For more information on this Offshore Light Tower or any other Gulf-Tek product, visit us on the web at www.gulfengine.com or call us toll free 1-800-925-4966.

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Variable Bore Rams and Cameron to begin offering new ram

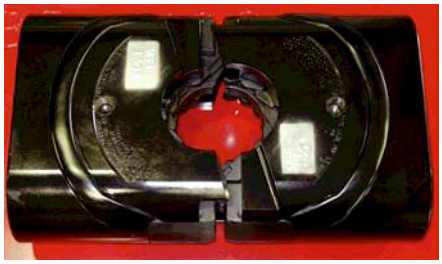
Variable Bore Rams, Inc. (VBR), one of the largest original equipment manufacturer ram providers in the world, in conjunction with Cameron, will begin offering 11-in. 3 1/2-in. to 5 1/2-in. variable bore rams, President Hines M. (Chip) Marshall, Jr. said.

The new variable bore ram closes on 3 1/2 inch to 5 1/2-in. casings, allowing customers to catch most pipe sizes without changing rams. The 11-in. 3-1/2 in. to 5 1/2-in. variable bore ram became available internationally in October and include types U, UL, and UM 3/10M.

This new variable bore ram size joins the already available Cameron variable bore, dual bore, dual flex bore, flex bore, straight blind, and straight bore rams distributed by VBR.

"At Variable Bore Rams, Inc., it is a priority to offer dependable products that improve our customer's bottom line," said Marshall, "We're thrilled to offer one of the most efficient products in the industry that will play a significant role in using 5 1/2-in. casings in shale gas exploration and production."

VBR provides support for blow-out



prevention operators worldwide and offers a wide variety of variable bore ram products. Stocking the latest in equipment and providing the most recent product upgrades, engineering updates, and technical bulletins, VBR is capable of providing services worldwide, 24 hours a day, 7 days a week, at a moment's notice.

For more information visit www.vbri.com.

IPAA and RegScan launch new product for oil and gas drillers

The Independent Petroleum Association of America (IPAA) and RegScan, have launched the IPAA Environmental Compliance System – PA. The system, powered by RegScan Socrates, is a unique, timeline-driven compliance system outlining regulatory requirements throughout the life cycle of a well.

Four major topics are covered: predrilling, drilling and completion, well production and operation, and well plugging and abandonment.

The comprehensive guide contains all of the regulatory requirements — fully integrated with fillable forms, encrypted document storage, permit applications, guidance documents, and audit checklists.

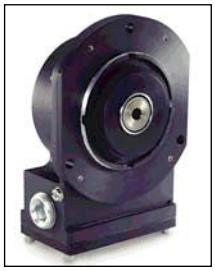
Through the Socrates project management platform, managers can assign and monitor tasks right from their desktops.

The online system gives users instant access to regulations, statutes; forms; and Environmental, Health, and Safety guidance – along with exclusive alert tools like Socrates Watch and Lookout.

For more information, visit the RegScan company website at www.regscan.com.

UL and ATEX rated explosion proof hollow shaft encoder by BEI

BEI Sensors has released the industry's first UL and ATEX rated explosion proof hollow shaft encoder, Model HS52. BEI has developed this ultra-rugged and space-saving industrial encoder to meet the high standards and certifications required for use in potentially explosive environments, including the oil and gas industry.



The HS52 is capable of operating directly in Division 1 and Zone 1 environments where ignitable concentrations of flammable gases, vapors, or liquids are likely to exist under normal operating conditions.

This rugged and reliable encoder does not require an accompanying Intrinsic Safety barrier, which simplifies installation and provides a more streamlined feedback system in explosion-proof environments.

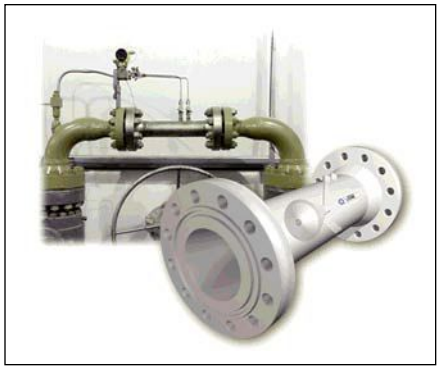
Using the explosion-proof construction method, this rotary encoder is housed in an enclosure that can withstand and contain an internal explosion of the most volatile gas-to-air mixture. Fitted with a flexible shaft bore design, the HS52 housing can be rigidly mounted, preventing stress to encoder bearings and providing a more secure attachment for the required hazardous area conduit fittings.

Additionally, the compact hollow shaft design offers engineers space-saving advantages over traditional shafted encoders. For more information, visit www.cstsensors.com.

V-Cone meter cuts WAG system installation and operational costs

Process engineers in charge of designing WAG Injection Systems for mature oil-gas reservoirs will find that McCrometer's V-Cone Flow Meter® features a space-saver design that reduces both installation and operational costs while improving oil production efficiency.

Water-Alternating-Gas (WAG) Injection is an enhanced oil recovery (EOR) technique that helps recover the oil in a mature reservoir, which has been in production for many years. This technique makes it is possible to recover significantly more oil by alternately injecting carbon dioxide (CO_2) gas with water. The CO_2 gas helps mobilize the remaining oil, while injecting water displaces the remaining oil and gas.



The versatile V-Cone Flow Meter is available in line sizes from 0.5 to greater than 120 inches in materials and with flanges compatible with any application. It operates over a wide flow range of 10:1, is accurate to ±0.5% and offers repeatability to ±0.1%. It features standard beta ratios of 0.45 to 0.85 with custom betas available.

For more information, visit the company website at www.mccrometer.com, or e-mail brownr@rbmarketing.com.

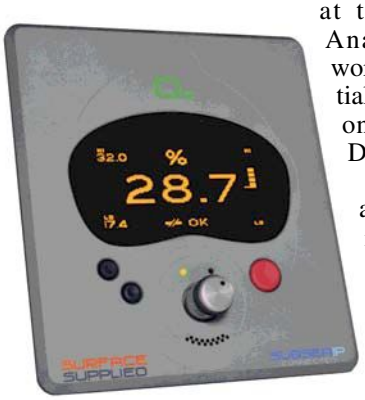
Taking a High Technology Approach To Saturation Diving

In 2010, SURFACESUPPLIED's Founder and CEO, Jason Van der Schyff, left his 5-year tenure with global diving equipment manufacturer Divex and relocated from Perth, Australia to California. "I'd landed in Silicon Valley and found myself in one of the most densely populated, technology and innovation rich regions in the world," He explains. "The diving industry was slowly coming down from the boom of the previous years and some remarkable technological advancements had been made, yet I couldn't help but look around me and see all these other opportunities and technologies begging to be brought to diving."

In September 2010, SURFACESUPPLIED formed a strategic partnership with local Silicon Valley technologists Phil Straw and Rob Drury of Heliox Technologies. Heliox specializes in the design, development, and manufacture of underwater technology products, primarily to the technical and military diving markets. With a strong pedigree in bespoke embedded electronics, Heliox and SURFACESUPPLIED worked together on an initial product offering targeted for Underwater Intervention 2011.

Gas Analysis

While many advancements in the overall monitoring and control of hyperbaric chambers were being developed and trialled in Europe, there was a fundamental lack of technology at the grass roots level of Gas Analysis. SURFACESUPPLIED worked with Heliox to build an initial suite of three products focusing on Oxygen, Carbon Dioxide and Depth/Chamber pressure.



The products take on a utilitarian approach to the analysis requirements. The user interface is intuitive and a move to a microprocessor based operation placed the products immediately at the forefront of what was available in the marketplace.

Incorporating patented optics, a Non Dispersive Infra Red (NDIR) carbon dioxide sensor was utilized in order to deliver the thinnest unit currently available in the offshore diving industry.

Hyperbaric Monitoring

Having set out with an initial focus on the saturation diving market, SURFACESUPPLIED have spent much of 2011 working on a turnkey Hyperbaric Monitoring system. Utilizing a combination of the technology previous developed for the UNIBODY range of gas analyzers, along with new technology developments, SURFACESUPPLIED will be launching the SATSENSE hyperbaric monitoring system at Underwater Intervention 2012 in New Orleans.

The hyperbaric monitoring system has been developed to accommodate any number and size of chambers within a saturation diving complex from the smallest portable systems to large class designated DSV-based systems. This has been achieved by leveraging off Heliox Technologies' proprietary communications protocol - SubseaIP. A sensing unit, placed either within or fed with gas from within the chamber, is connected onto an open topology SubseaIP network. Via very simple user interaction, the operator is able to identify the sensing unit and allocate it a location within the system.

Once connected, the sensing unit will feed the 7-in. LCD remote display with various parameters from within the chamber including, oxygen, carbon dioxide, temperature, humidity and the storage depth of the chamber. In addition, a separate video feed from within the chamber may be incorporated.

For larger systems or where a larger screen is required, SURFACESUPPLIED, in conjunction with Heliox Technologies, is able to provide bespoke implementations, including a great number of chambers, camera feeds and other sensing facilities such as high pressure gas storage.

Underwater Intervention 2012

SURFACESUPPLIED will be exhibiting at Underwater Intervention 2012 scheduled for 24-26 January in New Orleans. Along with the full range of gas analysis and the launch of the SATSENSE hyperbaric monitoring system, the company will also have on display their ECHO range of high fidelity chamber communications equipment, the industry's first dedicated high definition hyperbaric camera DELPHI HDHC. In addition, SURFACESUPPLIED will also be releasing a number of products focused specifically on the saturation diving bell including CO_2 and diver's breathing gas management and monitoring.

To learn more about SURFACESUPPLIED, visit www.surfacesup plied.com or stop by booth #822 at Underwater Intervention.

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Planning is the Key to Effectively Managing a Plug & Abandonment Project

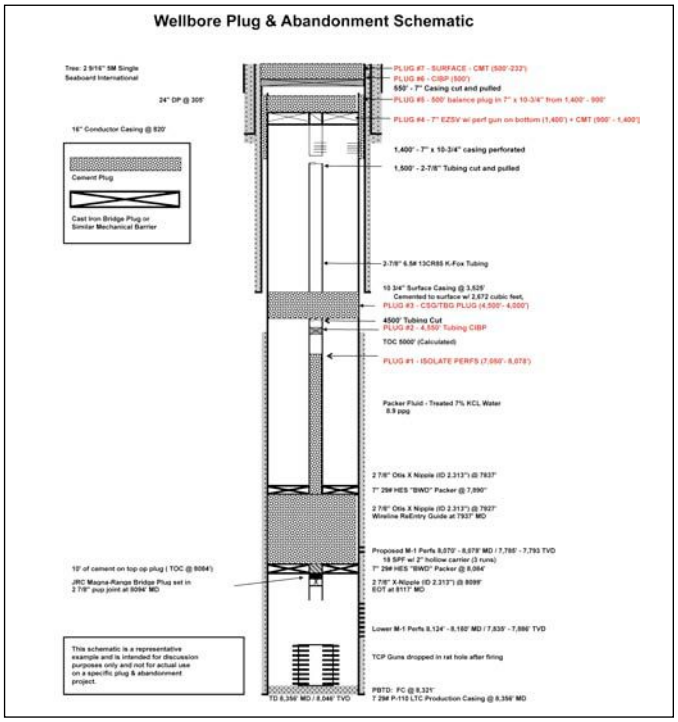
Tactics, tips and tricks to stay on budget and avoid downtime

By David Wright, Rodger Williamson, and Greg Hampton, Wright's Well Control Services

The management team at Wright's Well Control Services outline eight steps needed to properly prepare for a plug and abandonment (P&A). Their recommendations for careful planning at the beginning of a proposed P&A will result in cost savings, the avoidance of delays during operations, and well-control issues in the future.

Good project management is essential in the planning of a P&A (decommissioning). Proper coordination and scheduling is critical in the start-up phase and, when coupled with on-site expertise and supervision, will lead to smoother overall execution of the job. Planning a P&A is serious business, as only at the end of a well's lifecycle is it left without the protection of a tree or blow out preventers (BOP). A lack of planning and execution can lead to a well that starts to bubble; an ongoing well-control problem for the operator; environmental, pollution, and health issues; and additional expenditures to rework the P&A.

Finding in-house professionals and/or a contractor with extensive P&A knowledge is vital for all phases of the operation. An upfront investment in a veteran P&A team will help steer the operator clear of potential pitfalls and their added cost and downtime. For example, lost productivity and extra transportation expenditures due to hotshots, and dock and crane fees for additional tools and equipment overlooked during the planning phase can quickly accumulate.



This wellbore schematic shows the placement of cement barriers and cast iron bridge plugs (CIBP) or other mechanical barriers used for plug and abandonments. A proper P&A will have at least six barriers and include both cement and CIBPs. The seven barriers used in this diagram are noted in red beginning at the deepest point with PLUG #1 and rising to the surface cement at PLUG #7.

The following steps outline the best practices for preparing for a P&A project:

Step 1 – Terminate Production

The first step in the planning process is to terminate production operations. The operator designs a plan to safely discontinue production and secure the platform and well until the actual plug and abandonment operations can commence. This shut-down plan is also implemented to allow the P&A to proceed without the threat of a pollution incident.

Step 2 – Conduct Preliminary Well-Site Work

Diagnostic preliminary well-site work such as checking the annuli and tubing integrity by pumping kill weight fluid; checking injection rates and pressure; running wire-line to check for paraffin and tubing deviations; retrieving valves; and making gauge runs to ensure that the electric line will have no problems during the P&A process will provide a true picture of existing well conditions.

Step 3 – Planning a Well P&A

When an operator identifies a well to P&A, a review is conducted of the well design along with records of past work, tubing details/schematics, the well's past performance, and geological and reservoir conditions. Detailed and accurate recordkeeping throughout the life of the well will pay off when it is time to plan for its P&A. The operator investigates all items that may require protection for health and safety issues as well as meeting regulatory requirements. The operator then designs a P&A program based on existing wellbore and reservoir conditions with the goal of preventing future leakage and preserving the remaining natural resources.

A preliminary wellbore/wellhead inspection and survey is performed and the present condition documented. All of the valves on the wellhead and tree are checked to ensure operability, and inoperable valves are hot-tapped. A slickline unit is rigged up and used to check for wellbore obstructions, to verify measured depths and to gauge the internal diameter (ID) of the tubing and pull safety valves as needed. The slickline unit is then rigged down, and a well service pump is rigged up to fill annuli and tubing with seawater to establish an injection rate into perforations and/or to pressure up tubing to check for integrity. The casing annuli are also pressure tested and charts are made to check for communication problems between strings and to record the test pressures over time.

Step 4 – Look for Additional Cost Savings during the Planning Phase

Cost savings are realized by planning for multiple P&As during the same deployment. If several wells scheduled for P&A are in close proximity, the crew can readily perform work on a well and then move to the next one without the expense of repeated mobilizations. A contractor that offers small-footprint, rigless P&A services executed from a vessel of opportunity can further accelerate this multi-well strategy and hold overall costs down.

When decommissioning a platform, pipeline or other facilities, the initial P&A operations can further be leveraged as an opportunity to conduct prep work for the eventual removal. For example, the platform legs can be sounded and jetted with some of the same equipment and crews used for the P&A. Effective scheduling and coordination of all activities and processes results in little or no downtime, which translates into additional cost savings for the overall project.

Step 5 – Evaluate P&A Techniques and Options

Cementing

Like anything else, cementing materials perform only as well as they are designed to handle. Good cementing practices have been present elsewhere on many occasions, except on P&A projects.

The use of specialized cement of varying classes is dictated by the well profile. The cement used to P&A a well is just as critical as the technique used to cement casings during the drilling phase. The correct use of cement during the abandonment phase ensures not having to return to the well to repair any leaks.

In most cases, Class H is the primary cement used for P&As. Class H is the basic cement intended for use to 8,000 ft. WD and 200° F and is compatible with accelerators or retarders used over the complete range of cement Classes A through E. For deeper wells in the 10,000 ft. to 15,000 ft. WD range with a bottom-hole pressure of more than 3,500 psi and a temperature greater than 200° F, Class D cement is applied.

Class A or H can be used for intermediate and surface cement plugs. However, neither of these types of cement are designed to hold any tension from tubing or casing. To add strength to any cement plug, the use of silica flour and other additives provides resistance to high pressures or temperature changes over time.

Cast Iron Bridge Plug or Cement Retainer

The major enemies of a good abandonment are contamination of cement, temperatures and time. The operator needs to consider how long the abandonment is to last when selecting techniques for the job.

Cast Iron Bridge Plugs (CIBPs) are the best long-term insurance that a well will not leak. The CIBP provides a mechanical seal that will not crack or allow a micro annulus leak over time.

Step 6 – Develop P&A Procedures and Schematics

Salt water and cement are not enough to properly secure a well for plug and abandonment. The use of six or more layers of cement, kill weight fluid, and CIBPs to create multiple barriers is necessary to prevent the well from bubbling in the future. When these barriers are in place, pressure in the well should be less below the barriers than above. Schematics should clearly note the number of plugs, type of plug, and their depth.

Step 7 – Apply for Government Permits

The key here is to learn the exact requirements and procedures expected by the Bureau of Safety and Environmental Enforcement (BSEE) or the appropriate state agency. Correctly submitting procedures and schematics the first time will reduce the risk of a permit being returned to the operator for corrections or modifications which will only delay the start of the project. Once permits are approved the operator and contractor can develop a schedule and hold a spud meeting to prepare the mobilization and begin the P&A work.

Step 8: The Spud Meeting

All parties involved in the project should attend including engineers; representatives from the operator; the P&A team; logistics managers; crews for the jack up boat, rig, motor vessel, and E-line/slickline equipment; and any other third-party companies involved.

At the spud meeting, the parties participating will decide who is required to bring each piece of equipment. This group also needs to determine if all the equipment is compatible to minimize confusion and downtime once the project starts. Safety policies and any special procedures or precautions should also be discussed to ensure no one is blindsided by these rules once on location.

The parties can verify they have the proper personnel with the necessary training, experience and PPE (personal protective equipment) to run the project. Taking the time in the spud meeting to avoid sending the wrong personnel will help eliminate costly and time consuming problems once offshore.

Government requirements, well-control issues, special equipment requirements and deck-space load ratings are also reviewed. Equipment footprints and specs can be examined at this time too.

The more everyone involved in the project knows before operations starts, the better chance the operator will experience a smooth, cost-efficient project from mobilization to demobilization.

Conclusion

The P&A of a well is one of the primary stages of a facility decommissioning planning program. An effective P&A procedure is critical for the proper sealing of an oil and/or gas wellbore to safely secure it from future leakage. Techniques used to accomplish the process are based on industry experience, research and conformance with regulatory compliance standards and requirements. The synthesis of practical knowledge, current technology, and going beyond government regulation results in the most efficient well bore P&A possible. Only by planning ahead can an operator greatly increase the likelihood of success with a P&A program while effectively managing its cost.

David Wright, President

David Wright is the president of Wright's Well Control Services (WWCS) where he holds several patents for offshore technologies. Founded in 2006, WWCS offers well control, P&A, and subsea intervention services for clients in the Gulf of Mexico. He has 25 years of offshore experience including work at major energy service companies and an operator.

Rodger Williamson, Sr. Supervisor

Rodger Williamson has over 30 years of experience in the Gulf of Mexico working in supervisory and operational positions for well control and prominent energy services companies. Williamson was one of the first employees and managers to help start WWCS in 2006.

Greg Hampton, Operations Manager

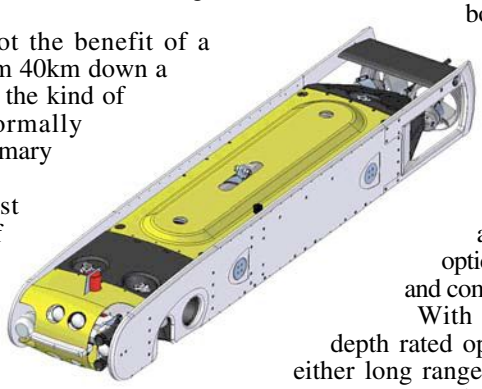
Greg Hampton has nearly 30 years of offshore industry experience with an extensive background as a P&A supervisor and wireline operator in the Gulf of Mexico and internationally. Hampton has served in operational and management roles at WWCS since the company was founded in 2006.

Sabertooth cuts teeth in Rocky Mountains

Hibbard Inshore, the Michigan-based deep tunnel and underwater specialist, is first to order the new Saab Seaeye Sabertooth hybrid long-range AUV/ROV.

Although ideal for hard-to-access subsea tasks, the Sabertooth hybrid has found its first role high in the Rocky Mountains.

Hibbard was quick to spot the benefit of a powerful vehicle that can swim 40km down a tunnel at speed and cope with the kind of turbulent conditions that normally make life too unstable for primary inspection sensors.



It means, that for the first time, a complete shutdown of water flow during tunnel inspection is no longer necessary.

Director Jim Hibbard was keen to pioneer the vehicle after seeing how the breakthrough product could benefit long tunnel projects around the world.

When proving the concept, Hibbard Inshore inspected for rock and debris a 15km tunnel that supplies a hydro plant and where shutdown was not possible without loss of revenue for the customer. Previously, such inspections had to be performed in a zero flow of water.

Planning to work in different places from tunnels to mines and waterways, where difficult water quality can be expected, Hibbard has their Sabertooth fitted with a range of equipment, including collision avoidance sonar, a navigation system, three cameras, lighting, and imaging sonar.

By combining the technologies of both AUV and ROV vehicles into a single unified resource, Saab Seaeye has created a vehicle with the range and maneuverability of an AUV, and yet the tooling capability of a light-work ROV. A choice of three operational modes is possible: autonomous roaming, attached fiber-optic cable, or umbilical carrying power and communications.

With its excursion range of 40km and depth rated option to 3,000m, it can embark on either long range programmable missions or under operator control around set targets with obstacle avoidance and precise maneuverability for safe and easy access, including swimming around and working inside complex structures.

Saab Seaeye see the hybrid AUV/ROV concept as offering an important new technological resource to a range of industries and applications across the world, with Sabertooth being the first of a new class of deep water, long-range, hovering hybrid vehicles.

For more information, visit www.seaeye.com.

CTC Marine secures Anguille contract

CTC Marine Projects, Ltd., ("CTC" or the "Company"), a subsidiary of DeepOcean Group Holding AS ("DeepOcean Group"), has been awarded a multi-million pound contract by SBM France SA for transportation, installation and burial works in the Anguille Field, Gabon.

Working in West Africa for only the second time, CTC will utilise the Maersk Recorder to perform the workscope, which will include collection of the power cable from Hartlepool, UK. The Maersk Recorder will lay 4 kilometers of cable, including a 650 meter beach pull and cable joint, and will be assisted by one of CTC's jet trenchers to undertake the burial of 49 kilometers of power cable along the route.

The 75 day workscope, for ultimate client TOTAL Gabon, is expected to commence in field in late December 2011, following the vessel's mobilization.

Martin Moon, Managing Director, said of the contract award, "We are delighted to have secured this workscope with SBM, which will see the Maersk Recorder operational throughout the winter season."

For more information, visit www.ctcmarine.com.

Unique wins $5.2M offshore diving project

Unique System FZE, a Unique Maritime Group company, has recently been awarded a $5.2 million contract to supply a 12 MAN ABS Classed saturation system and 3 air diving systems for the Leighton Offshore diving project, based in the Middle East.

Unique Maritime Group will provide their 12 MAN ABS Classed saturation system, complete with SPHL for subsea construction work activities and will deploy its equipment, consumables and skilled diving personnel on board client-designated vessels for the project.

The Iraq Crude Oil Export Expansion Project (ICOEEP), Phase 1, is being undertaken for Iraq's South Oil Company, by international EPCIC contractor Leighton Offshore in a US$799 million contract.

The ICOEEP Phase 1 includes the installation and commissioning of two 48" parallel pipelines, 20km onshore and 120km offshore, installation of three SPM systems (single point mooring systems) capable of receiving and loading VLCC tankers, fabrication and installation of a 600MT Subsea Valve Manifold, dredging works to achieve pipeline trenching and sufficient water depth for VLCC mooring, installation of subsea Fiber Optic Cables and Composite Power Fiber Optic Cables and installation and commissioning of Telecommunications and SCADA systems.

For more information, visit www.uniquegroup.com.

ROV operations spend to reach $1.7 billion

Total annual expenditure on ROV support of underwater operations is expected to grow from $891 million in 2010 to $1.692 billion in 2015. New research published by international energy business advisors Douglas-Westwood shows that the fundamental market drivers for the ROV business are in growth, and this is likely to continue for the foreseeable future.

Douglas-Westwood's latest edition of the World ROV Market Forecast 2011-2015 details the market for the operation of work-class ROVs. Europe is the largest market by a small margin over Africa with its strong growth driven by deepwater oil and gas activity.

The world fleet of work-class ROVs consists of 641 units operated by 21 companies, and Oceaneering is by far the largest player with 241 units (32% of the global total). The Douglas-Westwood report shows the present industry structure is the result of a series of mergers and acquisitions over some 30 years and M&A activity still continues.

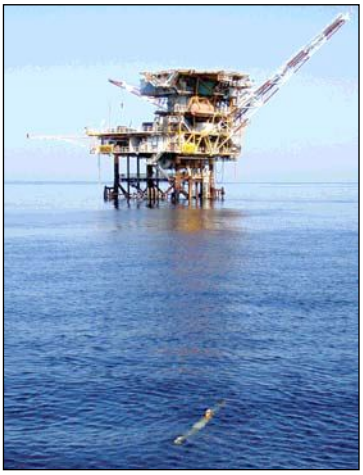
"Despite continuing turmoil in financial markets, in 2011 it seems that the offshore oil and gas industry is facing a future of significant growth; and in the longer term, we still have the full impact of Brazil's major pre-salt deepwater developments to come. In addition, new, albeit much smaller, markets are emerging in sectors such as the offshore wind. The next future looks good for the ROV industry," concluded Westwood.

For more information, visit www.dw-1.com.

Teledyne Gavia delivers Offshore Surveyor AUV to GAS Srl

Teledyne Gavia announced the sale and recent delivery of the Company's Offshore Surveyor class Autonomous Underwater Vehicle (AUV) to Geological Assistance and Services (GAS) of Bologna, Italy. The AUV, as configured by GAS, incorporates a 500kHz GeoSwath module and a Teledyne Benthos Subbottom Profiler (SBP) module as the primary survey sensors. The Gavia AUV has a depth rating up to 1,000m and includes GPS, Iridium, WLAN, obstacle avoidance, and acoustic communication as standard equipment.

Initial field trials and survey operations were conducted in the waters off Ortona, Italy and in the Adriatic from the vessel RV Odin Finder. High quality data were obtained from both the new Teledyne Benthos SBP and the 500 kHz GeoSwath



module. The Gavia AUV was especially useful when operating around drill rigs with 700m exclusion zones. The relatively small Gavia AUV does not rely on acoustic positioning feeds from a base vehicle, which allowed it to be launched outside the exclusion zone and safely survey the area within the zone. Typical operations utilized the full survey suite and two battery modules for extended duration operations.

For more information, visit www.gavia.is or www.teledyne.com.

Hydroid signs contract with NOAA for REMUS 600 AUV

Hydroid Inc., a subsidiary of Kongsberg Maritime and the leading manufacturer of AUVs, has received a contract from NOAA for a new REMUS 600 AUV system. The REMUS 600 will provide NOAA's Office of Coast Survey with full bottom coverage depth sounding data in conformance with NOAA standards for nautical charting.

Coast Survey is responsible for acquiring hydrographic data for NOAA's nautical charting program, which provides navigational products and services for the maritime industry and recreational boaters. The REMUS 600 will be used to evaluate whether depth soundings collected by an AUV provide data that meet NOAA bathymetric mapping requirements. Survey plans are developed to ensure 100% ensonification of the seafloor, so the REMUS 600 will initially be operated as a test system aboard NOAA survey vessels. Once standard operating procedures are established and the data validated, it will be used for operational bathymetric mapping surveys.

"We are pleased to continue our successful relationship with Hydroid, and we're confident that the REMUS 600 will perform admirably," said Rob Downs, Coast Survey AUV Project Manager. "The REMUS 600 evaluation marks a significant milestone in the advancement of nautical charting."

For more information, visit www.hydroid.com.

DYNACON, Inc. Achieves 25 Year Milestone

On 1 May 2011, DYNACON, Inc. achieved the milestone of 25 successful years in business.

The company was formed in May of 1986 with James H. Stasny and Joe R. Janac as equal partners on the day after the owners of a manufacturing company they were then working for shut the doors, leaving them both unemployed.

But that is not where the story begins. It begins several years earlier in 1974, when James and Joe, who were working in different departments at Texas A&M University, located in College Station, Texas, met one day by chance while fishing on a local lake. They soon began fishing together and became friends—a friendship that would be later tested when James convinced Joe to come to work for the same manufacturing company where he was then employed.

James had joined the company years earlier. His experience with marine winches and electronics, gained from 13 years of going to sea for the Oceanographic Department at Texas A & M University, was utilized in the design and manufacture of winches and other deck equipment.

Knowing that the company would benefit from Joe's engineering skills and unique machine design abilities, he convinced Joe to leave his current job to go to work there. A few months later they learned that the company was failing and that it would close its doors on 30 April 1986.

On 1 May 1986, DYNACON was organized as a general partnership with each of the partners depositing $300.00 in an account.

On 1 January 1987, the company was incorporated without a change of name and operated as a close corporation under the laws of the State of Texas.

In 1988, after receiving their largest order up to that time, they learned that the facility they were leasing was being sold. They needed a stable fabrication facility in which to complete the multi-year contract and continue to grow, but there were no suitable buildings in the immediate area. They had to choose: move to another area to find a suitable building, build their own building, or go out of business.

They chose to stay in the area and obtained financing from a local bank for a building fabricated to their design on four acres of land located at 831 Industrial Blvd., Bryan, Texas. They moved into the facility in March, 1989, less than four (4) months after the land was purchased. The facility consisted of 6,000 square feet of shop area and 4,000 square feet of office area.

With a continuing commitment to being "in it for the long run," DYNACON continues to grow based on repeat business and referrals from existing customers. Subsequent expansions of the facilities and property have resulted in the current facility which now includes over 80,000 square feet of shop/office area in four buildings and 40,000 square feet of specialized test area located on 16 contiguous acres.

Maintaining the company as a close corporation has allowed James and Joe to manage the growth of the DYNACON as well as respond to the growing diversity of opportunities, both domestic and international. Their prudent planning and utilization of the facilities and property affords DYNACON the capability to swiftly and proportionally increase their capacity for production, integration, and testing in response to future demands.

Joe R. Janac and James H. Stasny, co-owners of DYNACON, Inc.

DYNACON winches are the industry standard for handling remote operated vehicles (ROVs) around the world.

The DYNACON General Purpose ROV Winches, including the Model 421, 521, 521XL, and 721XL encompass a wide range of capabilities developed in response to customer and vehicle specific needs. Since its introduction in 1995, over 400 DYNACON General Purpose ROV Winches have been supplied to the industry worldwide with another 36 units currently in production.

DYNACON, Inc. celebrated 25 years in business on May 1, 2011

The Model 9966 A-Frame performs a luffing test with test weight

Keeping up with the demand for systems to work at deeper depths, the latest in the series of general purpose ROV winches, the DYNACON Model 721XL, is capable of handling 4,000m of 41mm diameter umbilical with a full drum safe working load of 15 tonnes. When used in conjunction with a DYNACON Model 1015 telescoping A-frame having an overboarding reach of over 5m, the handling system provides the operator a safe and reliable platform to launch and recover heavy work class ROVs from ships of opportunity or permanent installations.

Introduced in 1996, over 160 DYNACON self-erecting A-frames have been put into service including variations of the Model 6021, 6022, 6023, and the latest Model 9966. The Model 9966 has a SWL luffing rating of up to 13 tonnes, static overboard rating of 22 tonnes, and overboarding reach of 4m. The 9966 boom geometry has been configured to accomodate heavy duty ROVs with up to 1m tall work packages while allowing separation of the work package, TMS, and vehicle.

DYNACON continues to embrace the spirit of "give the customer what they need" and to seek out the specific needs of each customer for each particular application. With the success of each specific design and manufacturing project, they have accumulated a cache of unique cable handling solutions and products that can be applied across a wide range of segments of ocean-related industries, both military and commercial. DYNACON is positioned and motivated to meet the needs of their current and future customers for many more years to come.

Thrane & Thrane signs up as Inmarsat Global Xpress launch manufacturer

An agreement signed in September positions Thrane & Thrane, the leading Inmarsat FleetBroadband terminal developer, as a key launch manufacturer for the forthcoming Inmarsat Global Xpress service. With Thrane & Thrane on board, Inmarsat Global Xpress expects to go live in 2013 with brand-new SAILOR terminals designed specifically for use with this revolutionary new maritime Ka-band service. The introduction of state-of-the-art Global Xpress terminals will expand an already diverse portfolio. Thrane & Thrane has shipped more than 20,000 SAILOR FleetBroadband terminals since the launch of Inmarsat's current flagship service in November 2007, and soon the company expects to announce the commercial availability of its new SAILOR 900 VSAT antenna. As a Global Xpress launch manufacturer, Thrane & Thrane is uniquely positioned to offer high quality L-band/Ka-band combination packages in line with Inmarsat's expectations as well as provide Global Xpress terminals to shipping companies and offshore operators that already understand and recognize the SAILOR design and build quality (www.thrane.com).

Marlink and Sea Tel continue support of Project Kaisei

Marlink has teamed up with leading antenna manufacturer Sea Tel to provide satellite communications support to Project Kaisei for a third expedition. Set up by Ocean Voyages Institute of California in 2008, Project Kaisei seeks viable solutions to the growing problems associated with marine debris in the North Pacific Gyre, which can then be developed for all oceans of the world. Both VSAT antenna equipment and airtime have been donated to Project Kaisei by Sea Tel and Marlink to provide Ku-band coverage facilitating voice and broadband Internet that will function seamlessly, even in the remote areas that Project Kaisei will be operating. From real-time weather updates to blogging and e-mailing the latest information, photographs, and video, the satellite communications services support an extensive range of applications that are fundamental to Project Kaisei's success and dynamic education on the issue. For the last 3 years, the Ocean Voyages Institute has conducted expeditions to the North Pacific Gyre and California coastal areas as part of its ocean clean-up initiative. The Gyre/North Pacific Sub-tropical Convergence Zone is a remote and inaccessible area created by four major ocean currents and spans much of the Pacific, between California and Asia. This area, once a healthy oceanic ecosystem, is now home to a large concentration of toxic plastic proliferation (www.marlink.com or www.seatel.com).

Voyages of Discovery partners with MTN Satellite Communications

Discovery cruising line Voyages of Discovery has increased its breadth of television channels available on board and introduced a package of live TV programming through a new long-term agreement with MTN Satellite Communications (MTN), the global provider of communications, connectivity, and content services to remote locations around the world. Through the partnership with MTN, Voyages of Discovery now offers passengers worldwide coverage of seven additional U.S. and British-based channels, including BBC World News, Sky News, and Fox News from MTN Worldwide Television. The ship will also be able to deliver special broadcasts, such as major international sporting events. MTN uses three overlapping satellite beams to deliver programming content from major television network providers to Discovery – a relatively new technology to the cruising industry. Not only will passengers be able to keep up to speed on news, sports, and current affairs wherever they are in the world, Discovery will also offer passengers the usual access to movie channels, without the extra fees that many other cruise lines charge (www.mtnsat.com).

CP Offen selects FleetBroadband from Stratos

Stratos Global has been selected by Reederei Claus-Peter Offen (CP Offen) to provide Inmarsat FleetBroadband airtime services for its entire fleet of 122 commercial vessels.

CP Offen, based in Hamburg, is one of the world's largest suppliers of modern commercial ships, including 122 container vessels, tankers, and bulkers. CP Offen vessels are chartered by all of the world's largest operators.

By ensuring reliable broadband connectivity at sea, FleetBroadband from Stratos will help CP Offen vessels achieve optimal performance, improved business operations, and increased crew productivity.

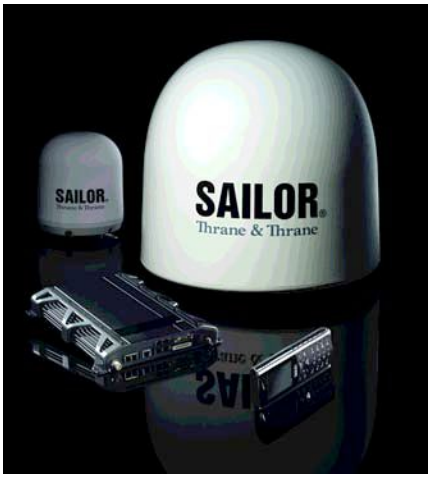
On the CP Offen fleet, Stratos is fully integrating FleetBroadband with AmosConnect — its sophisticated maritime communications application — to improve management of all interoffice communications. The integrated Stratos offering also improves crew welfare by deploying AmosConnect with Stratos ChatCards. The crew-communications solution enables personnel at sea to stay in contact with home via calling and private e-mail at affordable, flat global rates. The solution's high functionality helps retain qualified seafarers by providing an easily manageable, separate account for each crewmember.

Marlink, Thrane & Thrane sign agreement for new SAILOR 900 VSAT

Marlink and Thrane & Thrane have joined forces for the introduction of the brand new Thrane & Thrane SAILOR 900 VSAT antenna, which was commercially released in September 2011. Marlink has agreed to add the innovative new Ku-band antenna to its VSAT portfolio and offer it to its extensive global customer network.

SAILOR 900 VSAT is a powerful, quick, and easy-to-install four-axis stabilized Ku-band VSAT antenna, featuring a low-profile and high performance RF design. It can be easily integrated with all leading VSAT modem units, and the sophisticated Antenna Control Unit (ACU) features multiple LAN and diagnostics ports and built-in test equipment.

During the intensive development and testing of SAILOR 900 VSAT, Thrane & Thrane's in-house engi-



neers were supported by Marlink's experience as a key global maritime communication organization. The result is a cutting-edge Ku-band antenna designed to meet the demanding requirements of shipping and offshore companies with significant operational, installation, and maintenance benefits.

To ensure reliability of the SAILOR 900 VSAT aboard any vessel type, Thrane & Thrane built a unique antenna testing and simulation facility at its headquarters. The facility features a multi-axis hydraulic motion testing and simulation platform that uses real-life vessel motion and conditions to test the SAILOR 900 VSAT while it is connected to a live satellite. This extra testing ensures that the SAILOR 900 VSAT is ready for installation aboard vessels of all sizes and types.

For more information, visit www.marlink.com or www.thrane.com.

Comtech EF Data, Intellian complete technology integration

Comtech EF Data Corporation and Intellian Technologies announced the successful technology integration of the v-Series antennas and the ROSS Open Antenna Management (ROAM) protocol. The integration will enable the satellite VSAT antenna systems on maritime vessels to globally roam across multiple satellite beams, maintaining connectivity moving through different satellite footprints and enhancing communication capabilities at sea.

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

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

Intellian v-Series stabilized communication antenna systems provide access to high-quality satellite communications at sea, even in the roughest weather conditions. The open platform design and always on high-speed broadband connection works in conjunction with any SCPC or TDMA network from around the globe. This system continues with Intellian's philosophy of ease to use, simple, and reliable. The built-in GPS and auto-skew angle control are used to acquire the satellite signal faster, and other built-in controls allow users to optimize the signal strength.

For more information, visit www.intelliantech.com or www.comtechefdata.com.

New Cyprus hub for NSSL and Telemar Scandinavia

Satellite communications providers NSSL and Telemar Scandinavia announced the extension of their DVBS2-RCS broadband network, making them the most comprehensive KU band providers in the world. Stretching to new areas of the globe, the coverage extensions are coupled with a unique beam handover capability, ensuring uninterrupted connectivity across the world's major sailing routes. This significant service addition is part of NSSL and Telemar Scandinavia's continuing investment in their respective CruiseIP and SeaCall services.

This investment means that, for the very first time, commercial shipping and leisure vessels traveling across numerous KU-Band coverage beams will be uninterrupted in their communications services. Although other operators may eventually be able to offer their customers similar coverage areas, it is the automatic beam handover capability that ensures seamless DVBS2 coverage without the need for hardware changes or significant manual intervention.

The new Cyprus hub means that customers will now be able to enjoy up to 4 Mb download speeds across two new major maritime routes: the Indian Ocean region, including the coasts of India, Thailand, and China; and the coasts of Australia, New Zealand, and Papua New Guinea.

The news follows quickly on the heels of the additional Atlantic Ocean coastlines of Africa and South America and the North Pacific Ocean coverage that came into service during 2009 and early 2010. This ensures that NSSL and Telemar Scandinavia can offer its maritime customers near-global seamless coverage.

For more information, visit www.nsslglobal.com or www.telemar.se.

MTN and Sensory International partner to deliver services

MTN Satellite Communications (MTN) and Sensory International announced a partnership to provide integrated VSAT services and connectivity to superyachts. As a result of this partnership, customers now have a single source for procuring all of their onboard automation requirements supported by the most reliable VSAT connectivity available.

Sensory will provide MTN's reliable VSAT services and support to its customers that own yachts 50m or more in length. In addition, MTN's VSAT systems will serve as the cornerstone product in Sensory's new communications division. The companies are beginning to work together on projects and training Sensory's staff to provide technical support for MTN's VSAT solutions to ensure that customer service is consistent around the globe.

MTN continues to expand sales and service capabilities through its tiered partnership program and agreements with leading marine electronics companies in major maritime centers. These relationships ensure prompt and attentive shipboard service and technical support products around the world.

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

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Subsea Cables

GBI awards Xtera contract to deploy 100G

Gulf Bridge International (GBI), the Middle East's first carrier neutral regional network, and Xtera Communications, a leading global provider of optical networking solutions, have announced the signing of a multi-year, sole source contract. Under the terms of this contract, Xtera Communications will supply GBI's 100G networking needs for terrestrial and upgrades of submarine routes in Europe, the Mediterranean and North Africa. The contract provides Xtera with full turn-key responsibilities. The contract also includes Xtera's full portfolio of optical networking products. GBI is heavily investing to meet the growing wholesale capacity demands of the Middle East and improving network connectivity and geographical reach to the rest of the world. GBI is counting on the most advanced optical networking technology developments to deliver new services to existing and emerging regions. The 100G line transmission rate deployment will play a key role in GBI's service delivery strategy (www.xtera.com or www.gulfbridgeinternational.com).

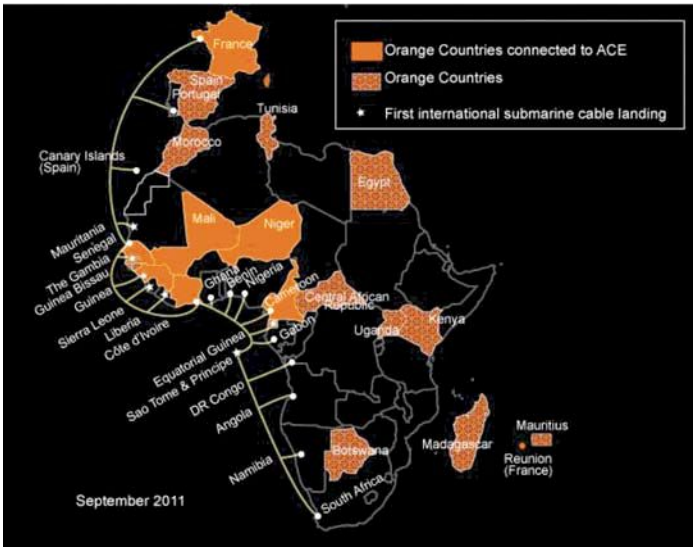
Reliance upgrades cables

Reliance Globalcom announced the commercial launch of the upgraded capacity on Flag Europe Asia (FEA) and FALCON Cable Systems to over 500 Gbps. The upgrade in the cables would usher in a bandwidth revolution on the 23 countries along the route connecting Europe, the Middle East, Asia, and the Far East. The 400% upgrade in capacity would help in addressing present and future bandwidth requirements along the route of the cable, which the company said is growing 60% year-on-year. The capacity upgrade on the Europe-Middle East route and seamless integration with cable systems in North America, Far East Asia, China, and the Mediterranean region put Reliance Globalcom in a position to offer high quality international Internet connectivity (www.reliance globalcom.com).

Global Marine ranked in the Sunday Times HSBC Top Track 250

Global Marine Systems Limited has been ranked number 207 in the Sunday Times HSBC Top Track 250. The league table, published by Fast Track, complements Britain's leading mid-market private companies with the biggest sales, listing the next 250 biggest companies. The Chelmsford-based company, which installs and maintains subsea cables worldwide for the telecom and energy industries, was recognized for its increase in profits. Top Track 250 is compiled by Fast Track and is published in The Sunday Times each October. "New to the table is submarine cable specialist Global Marine Systems, which reported 2010 sales to £186.6m," said a Fast Track spokesperson. At the awards dinner on 13 October, Ian Henley, head of Corporate and Structured Banking at HSBC, stressed the important role that private businesses can play in helping to drag the UK economy from its prolonged downturn and said that HSBC wants to support strong UK companies. Global Marine Systems is currently installing cables for several offshore wind projects in the North Sea and will also be installing the $300 million transatlantic Hibernian Express fiber-optic communications cable, which will connect the UK with the U.S. and is specifically designed to improve technology for financial trading (www.globalmarinesystems.com).

France Telecom-Orange announces landing of ACE in France



ACE, the Africa Coast to Europe submarine fiber optic cable to be operational in the second half of 2012, has been landed at the submarine cable station of Penmarc'h, Brittany. The 17,000km cable provides broadband Internet capacity in Africa, an additional layer of security for communications between Europe, Africa and Asia, and it will meet capacity requirements for years to come.

The ACE cable will provide access to the global broadband network for the first time for Gambia, Guinea, Equatorial Guinea, Liberia, Mauritania, São Tomé and Príncipe, and Sierra Leone, making possible the launch of new services. Landlocked countries such as Mali and Niger will also be connected via the terrestrial network.

ACE will provide an alternative route for communications to countries already connected to the SAT3-WASC-SAFE cable linking Portugal to Malaysia, which runs along the west coast of Africa.

Through links to other submarine cables, ACE will also provide an alternative western route for traffic between Europe and Reunion as well as the Group's subsidiaries in Africa and the Indian Ocean. ACE will also diversify transmission arteries between France and Portugal.

To carry out this ambitious project, France Telecom SA, and its subsidiaries Côte d'Ivoire Telecom, Orange Cameroon, Orange Guinea, Orange Mali, Orange Niger, and Sonatel have combined forces with a number of other major partners as part of an international consortium.

At the Penmarc'h station, ACE is connected to SEA-ME-WE-3, the world's longest cable. The Group is co-owner of this cable, which links Europe to Japan and Australia via India. With interconnections to the Group's other submarine cable stations via Penmarc'h and the France Telecom-Orange national network, ACE will be in a position to offer greater connectivity, especially with the United States via the transatlantic cables.

ACE relies on wavelength division multiplexing (WDM), currently the most advanced technology for submarine cables. With WDM, cable capacity can be increased without additional submarine work. The new 40 Gbps technology supporting the ultra-broadband networks will boost overall capacity to 5.12 Tbps.

The cable's construction represents an overall investment of around $700 million for the consortium, of which around $250 million will come from the Group and its subsidiaries. This major investment furthers two strategic objectives of France Telecom-Orange: to provide widespread Internet access to African countries where the Group is present and to further develop the service quality of the Group's international network. Through cables such as ACE, the Group is able to provide high-end connectivity in Africa and to offer a range of innovative services to support the continent's economic and social development.

For more information, visit www.orange.com.

Sea Fiber Networks moves ahead with CeltixConnect

Sea Fiber Networks (SFN), owner and operator of CeltixConnect, confirmed that its new submarine fiber optic cable will be commissioned and live for customers by 12 December 2011. SFN confirmed signing contracts with NSW and Global Marine Systems (GMSL) for cable manufacture and subsea cable lay, respectively. SFN confirmed works were already underway on the terrestrial routes in Holyhead and Dublin.

CeltixConnect, linking Ireland and the UK, will enable the infinite growth of data driven by inter alia, cloud computing, online gaming, social media, and mobile data devices. CeltixConnect will underpin and enhance the escalating data center industry struggling to meet the demands in managing data and facilitating associated data analytics services.

GMSL began the subsea lay in November, while NSW was selected to manufacture the high-count, 144-fiber cable that will more than double the existing capacity connecting Ireland and the United Kingdom.

CeltixConnect will land directly in the heart of Dublin's business district at East Point Business Park and the Irish Financial Services Centre (IFSC), requiring only 5km of terrestrial backhaul before connecting with multiple networks for resilience and competitiveness. CeltixConnect then intersects with the T50, Dublin's major metropolitan network that links all key business districts, data centers, and business parks.

In the UK, the privately owned carrier neutral cable will land at Anglesey, a recently announced enterprise zone for the energy sector in Wales, and will onward connect to Manchester, London and mainland Europe.

For more information, visit www.celtixconnect.com.

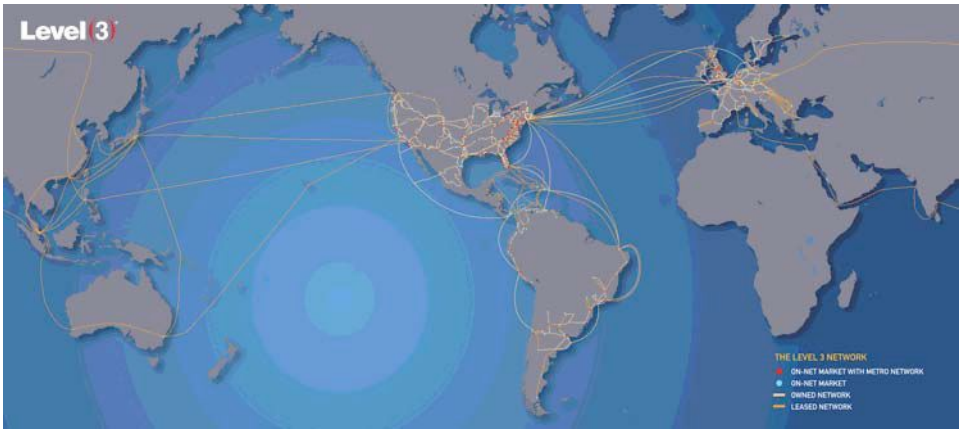
Level 3 and Global Crossing receive regulatory approvals

Level 3 Communications, Inc. and Global Crossing Limited announced that the U.S. Department of Justice has cleared Level 3's previously announced acquisition of Global Crossing. The clearance completes the process under the Hart-Scott-Rodino Antitrust Improvements Act of 1976 (HSR) and is effective immediately. Level 3 also announced that the Federal Communications Commission has issued an order approving the transaction, effective immediately. Level 3 expects to close the transaction as soon as possible.

Global Crossing Limited's major submarine cable subsidiary is GT Landing II Corp., a Delaware corporation and a wholly owned indirect subsidiary of GCL. GT Landing II Corp. principally owns and operates the U.S. territory portions of five submarine cable systems, for which it holds cable landing licenses.

- Atlantic Crossing-1 (AC-1), a non-common carrier system connecting Brookhaven Township, New York, with Sylt, Germany; Beverwijk, the Netherlands; and Whitesands, UK.
- Atlantic Crossing-2 (AC-2), where GT Landing II owns a half-interest in a non-common carrier system connecting Brookhaven, New York with Bude, UK . The other half-interest (called the Yellow system) is owned by Level 3 Communications, LLC.
- Mid-Atlantic Crossing (MAC), a non-common carrier system connecting Brookhaven, New York; Hollywood, Florida; and St. Croix, U.S. Virgin Islands.
- Pan American Crossing (PAC), a non-common carrier system connecting Grover Beach, California; Tijuana and Mazatlan, Mexico; Jaco, Costa Rica; Fort Amador and Ambush Range, Panama; Puerto Viejo, Venezuela; and St. Croix, U.S. Virgin Islands.
- South American Crossing (SAC), a non-common carrier system connecting St. Croix, U.S. Virgin Islands with Fortaleza, Rio De Janeiro and Santos, Brazil; Las Toninas, Argentina; Valparaiso, Chile; Lurin, Peru; and Fort Amador, Panama.

These submarine cable systems will join Level 3's existing network that include, besides the Yellow system mentioned above, capacity on multiple cables covering the transatlantic, Pacific Rim, South America, and Europe-Asia routes.



For more information, visit www.level3.com.

NEC completes 40G upgrade

NEC Corporation has announced the successful completion of a multi-million dollar contract with a purchasing consortium of 14 major telecom operators in the Asia Pacific region for the world's first 40 Gbps dense wavelength division multiplexing (DWDM) capacity upgrade to an existing large-scale submarine cable network.

The existing APCN2 (Asia Pacific Cable Network 2), with over 19,000km of cable that connects 10 landing stations in the Asia Pacific region, was originally supplied by NEC in 2001 with a 10 Gbps DWDM system design. In response to the rising transmission demands in the region, NEC proposed its state-of-the-art 40 Gbps DWDM technology as a dramatic enhancement and expansion to the capac-

ity of the existing 10 Gbps submarine cable network. NEC estimates that by adding 40 Gbps wavelengths the cable's capacity can be expanded by as much as 4 times its original ultimate design capacity of 2.56 Tbps.

The NEC NS Series T640SW Line Terminal Equipment features the ability to combine 10 Gbps and 40 Gbps wavelengths, a 50% reduction in size and power consumption as compared to previous models and state-of-the-art technology, such as Tunable wavelength light sources (Tunable LD) and Tunable Dispersion Compensation per wavelength (TDCM), that allow the highest system flexibility and availability.

The benefits to the customer include the improved value of existing assets by increasing ultimate design capacity by 4 times through state-of-the-art 40 Gbps DWDM technology as well as a savings on CAPEX and OPEX.

For more information, visit www.nec.com.

Pacific Crossing, Infinera complete transpacific 100G trial

Infinera and Pacific Crossing, a wholly-owned subsidiary of NTT Communications Corporation and operator of the transpacific submarine cable system PC-1, have announced the successful completion of a 100 Gbps subsea trial. The subsea trial spanned more than 9,500km on Pacific Crossing's PC-1 fiber from California to Japan. This is the first and longest successful 100 Gbps trial performed across the Pacific delivering digital coherent transmission.

This trial demonstrates the unique ability to deliver two industry firsts. The 100 Gigabit Ethernet (GbE) demonstration was the first transmission of a 100 GbE client service carried across the Pacific using 40 Gbps optical channels with Infinera's FlexCoherent transmission. The success of this trial was based on Infinera's commercially available 40 Gbps optical line module and 100 GbE client interface on Infinera's DTN platform. The second demonstration was the first realization of a 100 Gbps optical channel using binary phase shift keying (BPSK) with soft decision forward error correction (SD FEC) that will be available in the future on Infinera's DTN-X platform.

Infinera's FlexCoherent technology enables service providers to optimize transmission performance across a range of applications using multiple software-programmable modulation formats. Infinera recently announced the availability of new DTN capabilities and the new DTN-X platform featuring both photonic integrated circuit (PIC) based super-channels and FlexCoherent transmission.

The Asia Pacific region has been experiencing exponential growth in Internet bandwidth demand. According to Internet World Stats, the number of Internet users in Asia grew from 114 million to 922 million from 2000 to 2011. The growth is forecast to continue, thereby driving the need for subsea networking equipment that can deliver the required capacity.

Infinera has completed successful trials of 100 Gbps and 500 Gbps super-channels across the globe, recently with SEACOM in Africa and Interoute in Europe. To underscore its commitment to provide enhanced levels of service and support for customers in the Asia Pacific region, Infinera recently opened an office in Hong Kong with a customer demonstration center and a training center for its growing client base in the region.

For more information, visit www.infinera.com or www.pc1.com.

Siemens technology used on HVDC cables to Mallorca

Siemens has delivered high-voltage direct-current (HVDC) technology that allowed Red Eléctrica de España (REE) to link Mallorca with the Spanish mainland via an electricity highway laid in the Mediterranean. In the future, a significant proportion of the vacation island's power demand will thus be met using wind, solar and hydroelectric power that is produced on the mainland. At the same time, supply security to the island will be enhanced.

REE linked the island of Mallorca to the Spanish mainland power grid. Siemens delivered the necessary HVDC technology for the conversion of alternating into direct current. The submarine cable link with a length of 244km connects Morvedre near Valencia with this HVDC station in Santa Ponsa near the island's capital city, Palma de Mallorca. 400MW can be transmitted nearly loss-less with a HDVC of 250 kV. The first-time connection to the Spanish mainland electricity market helps to satisfy peak demand of the island, especially during high season in the summer months.

Under contract to the Spanish grid operator, Siemens installed two converter stations for the conversion of alternating into direct current, one in the vicinity of the island's capital city Palma de Mallorca and a second on the Spanish mainland near Valencia. A 244km-long power line was laid through the Mediterranean between the two stations.

Cable links longer than 80 km are only possible with HVDC transmission technology. That's because for underground or submarine cables, hardly any electricity is delivered when AC lines are this length or longer because the cable's insulation serves as a capacitor and becomes charged, thereby absorbing the electricity. The link laid to Mallorca comprises three submarine cables, which were supplied by Prysmian and Nexans and laid at a depth of as much as 1,485m on the Mediterranean seabed.

For more information, visit www.siemens.com.

ABB commissions power link to Valhall offshore platform

ABB has successfully commissioned a power link from the southern Norwegian mainland grid to BP's Valhall multi-platform complex in the North Sea.

The HVDC Light link is a highly reliable, cable-based, state-of-the-art power transmission system that will enable power from shore to supply the offshore complex. The power link will allow BP to substitute the use of offshore gas turbines to generate electric power, thereby eliminating up to 300,000 tons of carbon dioxide (CO_2) emissions a year - equivalent to the annual emissions of around 125,000 modern European cars.

The installation includes one converter station onshore connected by an HVDC submarine cable to a second converter on the platform, about 294km offshore. It allows 78 MW of power to be supplied from the mainland to run the field facilities, including a new production and living quarter platform. The new platform is being commissioned by BP to replace some of the existing platforms at the Valhall oil and gas field during the next year.

For more information, visit www.abb.com.

CTC completes surface lay on Jeju Project

CTC Marine Projects, Ltd., a subsidiary of DeepOcean Group Holding AS, has safely and successfully completed the Pole 1 and 2 surface laying campaigns on the Jeju project in South Korea.

The Maersk Responder has laid two cable bundles between Jeju Island and Jindo Mainland Korea, which will provide further power to the island as well as data for the island's first Internet connection.

In total, CTC has completed the surface lay of over 600km or 13,000 tons of HVDC cables and fiber optic cables in what has been a complex and challenging workscope. In late June, CTC completed the record breaking mobilization of the Maersk Responder in Donghae Port Korea, carrying a weight of the over 7,000 tons of HVDC cable onboard.

The Maersk Responder has now offloaded the remaining cable at the factory in Donghae and commenced demobilization from Korea. CTC will continue to complete trenching operations on the Pole 1 campaign using the DP2 Volantis vessel, accompanied with the world's most powerful jet trenching ROV, UT-1.

For more information, visit www.ctcmarine.com.

OMM and OMS expand business

Offshore Marine Management (OMM) is significantly expanding its business in the German sector via the establishment of its first Operational Support Base at Cuxport. OMM's German subsidiary, Offshore Marine Services GmbH (OMS), is also investing in its headquarters in the City of Bremen by recruiting new permanent staff, including John Grimmond as business development manager.

The Operational Support Base will support OMS' aspirations to be a key supplier of installation along with operations and maintenance services to the German offshore wind sector. The base at Cuxport is an average sailing time of four hours to the German Bight's wind farms and includes 12,000 sq. m of prime quayside land, a minimum quayside water depth of 8m, ample public quay wall, and office space. A long-term agreement ensures OMM's position within the German market for many years to come.

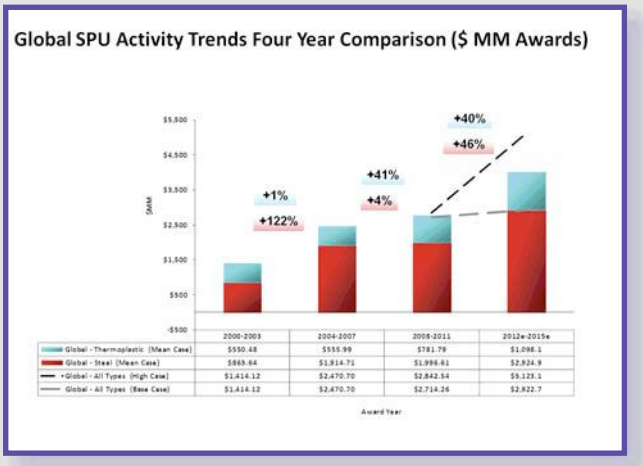
The initial phase of the base development will include significant covered and uncovered storage for components and spares as well as the establishment of a bespoke crew vessel transfer system. As part of the agreement, OMS has secured a handling contract from Cuxport itself and a marine vessel agency agreement with Rhenus Logistics.

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

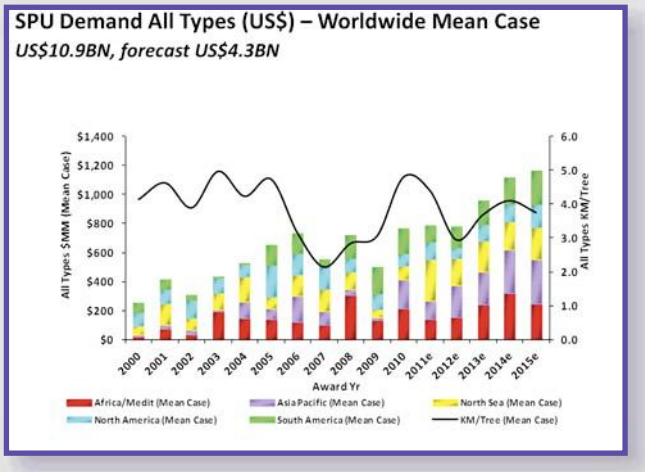
Offshore At-A-Glance

Quest Offshore Activity Report

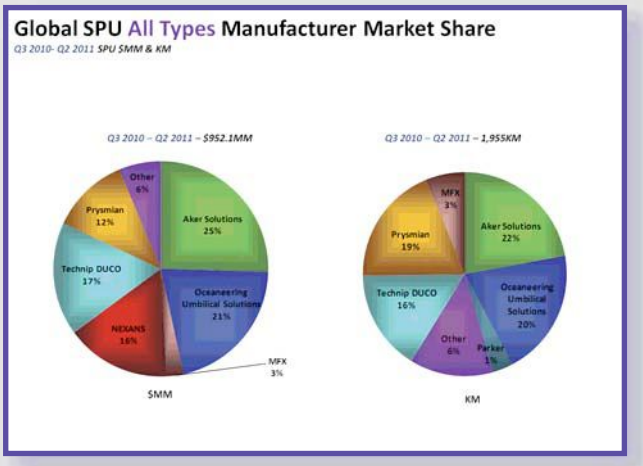
Global SPU Activity Trends



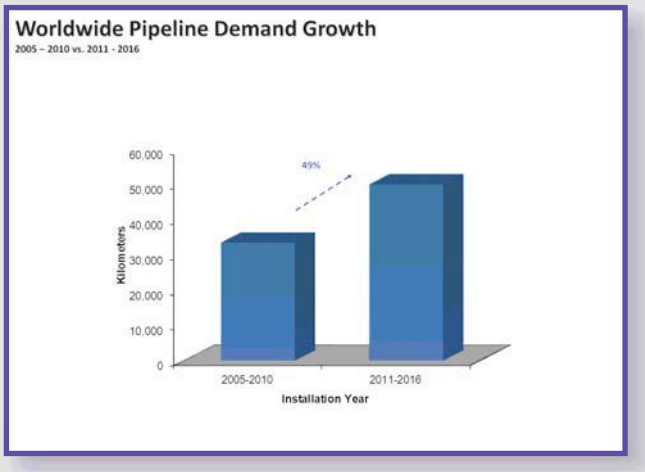
Worldwide SPU Demand



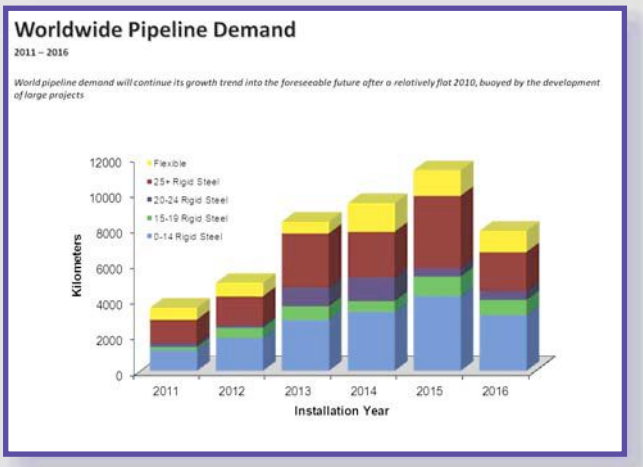
SPU Manufacturer Market Share



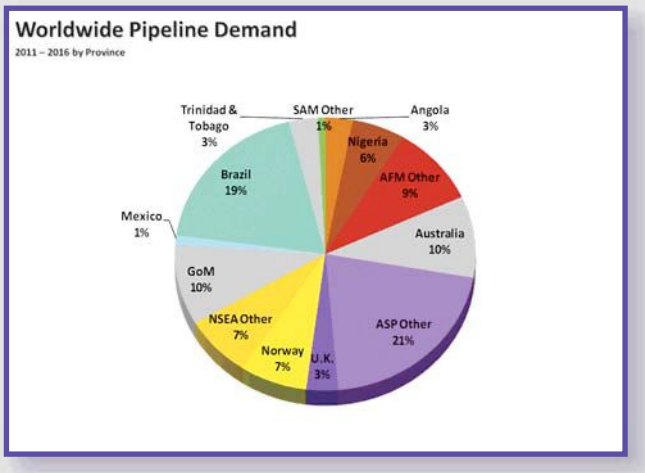
Worldwide Pipeline Demand Growth



Worldwide Pipeline Demand



Worldwide Pipeline Demand by Producer



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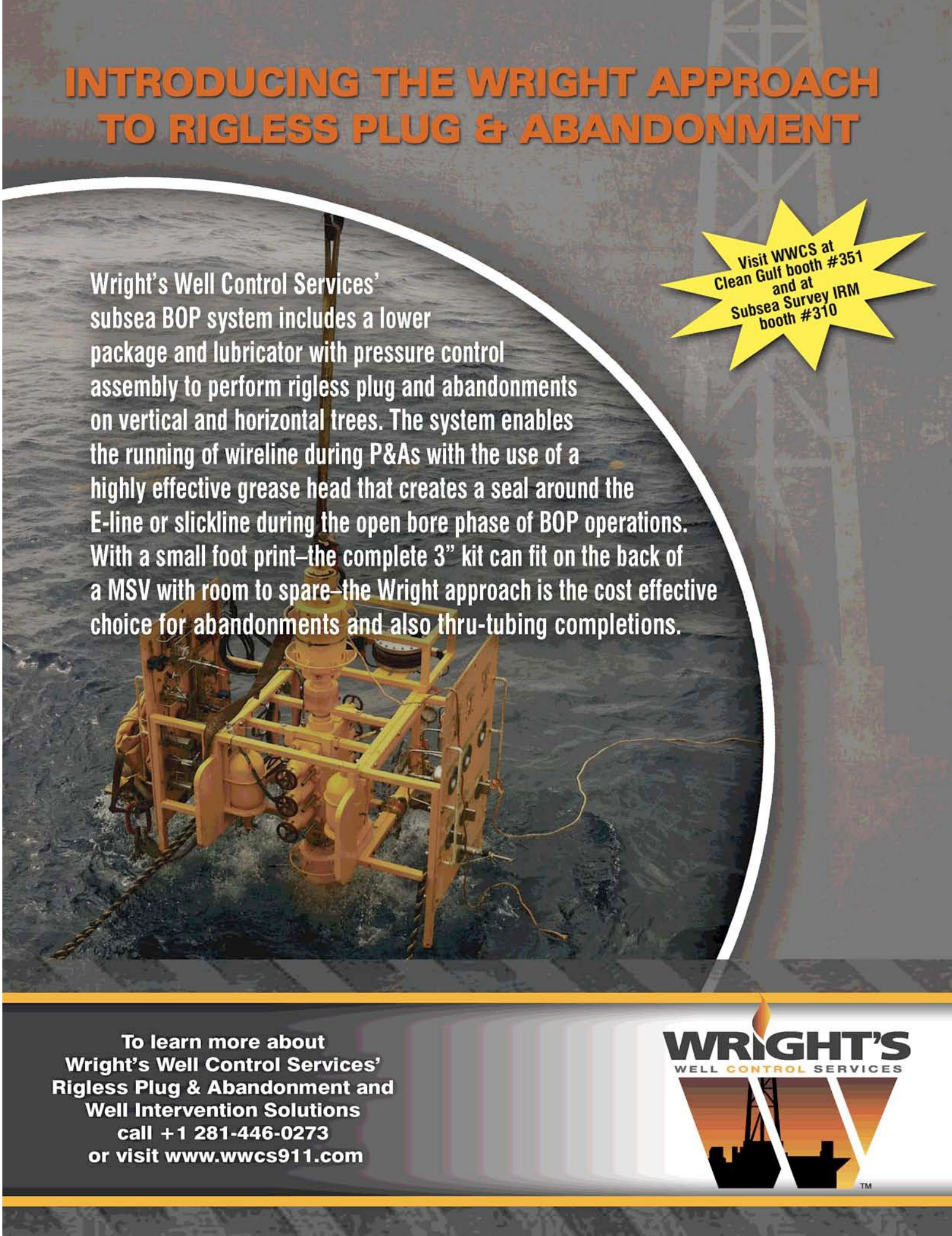

To learn more about Wright's Well Control Services' Rigless Plug & Abandonment and Well Intervention Solutions call +1 281-446-0273 or visit www.wwcs911.com

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Gulf of Mexico Data

Current Deepwater Activity

Operator	Area/Block	OCS Lease	Rig Name	Prospect Name	Water Depth(ft)
Anadarko Petroleum Corp.	LL 400	G23481	MAERSK DEVELOPER		9,179
Petrobras America Inc.	WR 206	G16965	PRIDE DEEP OCEAN MENDOCINO	Cascade	8,143
Shell Offshore Inc.	AC 857	G17565	NOBLE DANNY ADKINS	Great White	7,995
Shell Offshore Inc.	AC 857	G17561	H&P 205	Great White	7,823
Shell Gulf of Mexico Inc.	MC 348	G19939	T.O. DEEPWATER NAUTILUS	Camden Hills	7,257
BP Exploration & Production Inc.	GC 743	G15607	T.O. DEVELOPMENT DRILLER II	Atlantis	6,824
BP Exploration & Production Inc.	KC 292	G25792	SEADRILL WEST SIRIUS	Kaskida	6,034
Eni US Operating Co. Inc.	MC 772	G16647	T.O. DEEPWATER PATHFINDER	Triton	5,639
Union Oil Co. of California	WR 143	G21849	T.O. DISCOVERER INSPIRATION	Coronado	5,495
BP Exploration & Production Inc.	GC 743	G15607	T.O. DEVELOPMENT DRILLER III	Atlantis	5,405
Anadarko Petroleum Corp.	GB 877	G21408	CAL DIVE Q-4000	Red Hawk	5,334
Anadarko Petroleum Corp.	GC 903	G24197	T.O. DISCOVERER AMERICAS	Heidelberg	5,259
Noble Energy, Inc.	GC 723	G21813	ENSCO 8501	Deep Blue	5,040
BHP Billiton Petroleum (GOM)	GC 738	G16786	T.O. DEVELOPMENT DRILLER I		4,468
BHP Billiton Petroleum (GOM)	GC 654	G20085	GSF C.R. LUIGS	Shenzi	4,337
Chevron USA Inc.	GC 640	G20082	T.O. DISCOVERER DEEP SEAS	Tahiti 2	4,292
Chevron USA Inc.	GC 640	G16770	T.O. DISCOVERER CLEAR LEADER	Tahiti 2	4,292
ATP Oil & Gas Corp.	MC 941	G16661	NABORS 202	Mirage	4,000
Shell Offshore Inc.	MC 935	G07976	NOBLE DRILLER	Europa	3,789
Anadarko Petroleum Corp.	EB 602	G14205	ENSCO 8500	Nansen	3,678
Nexen Petroleum USA Inc.	GC 504	G22968	ENSCO 8502		3,600
ATP Oil & Gas Corporation	GC 299	G22939	DIAMOND OCEAN VICTORY	Clipper	3,456
Murphy E&P Co.	GC 338	G21790	NABORS MODS 200	Front Runner	3,325
Shell Offshore Inc.	MC 762	G24112	NOBLE JIM DAY	Deimos	3,140
Shell Offshore Inc.	GC 158	G07998	H&P 202	Brutus	2,985
Shell Offshore Inc.	MC 807	G07963	H&P 201	Mars B	2,945
Shell Offshore Inc.	GB 427	G07493	NOBLE JIM THOMPSON	Auger	2,719
Chevron USA Inc.	VK 786	G10944	NABORS 87	Petronius	1,754
Stone Energy Corp.	MC 109	G05825	H&P 206	Amberjack	1,030
Stone Energy Corp.	VK 817	G09743	NONE RIG PA OPERATION	Longhorn	673

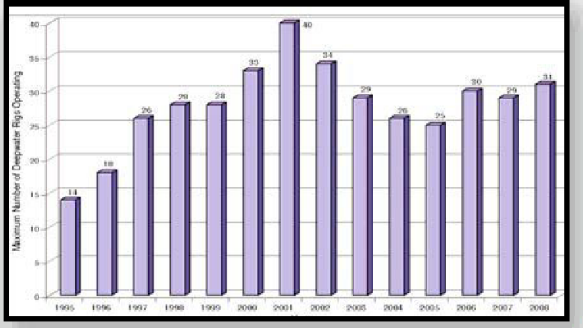
Deepwater prospects with drilling and workover activity: 30

Current Deepwater Activity as of Monday, October 31, 2011

Activity by Water Depth

Water Depth in Meters	*Active Leases*	*Approved Applications*	*Active*
0 to 200	*1,856*	*33,937*	*3,054*
201 to 400	*129*	*1,111*	*20*
401 to 800	*281*	*836*	*10*
801 to 1,000	*388*	*519*	*7*
1,000 & above	*3,257*	*1,672*	*26*

Rig activity by year



Activity by water depth Information current as of Monday, October 31, 2011

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

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

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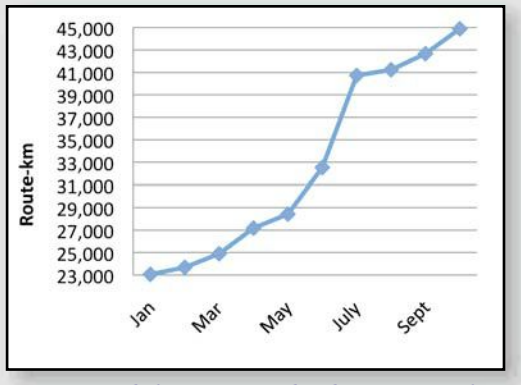
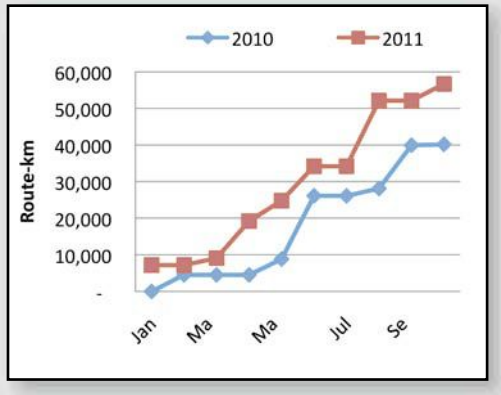
Subsea Telcom & Power Cable

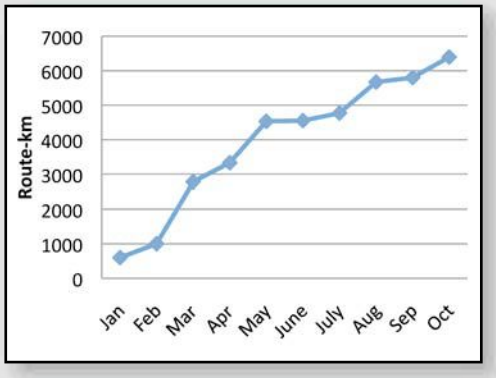
FO Cable Announcements 2011



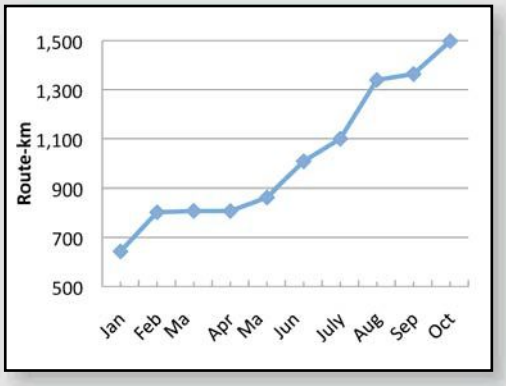
FO Cable Awards by month



Submarine Power Cable Announcements 2011 in route-km



Submarine Power Cable Awards 2011 in route-km



Buried subsea pipeline removal tools

The challenge of removing subsea pipeline from under rock berms during decommissioning is heralding the development of new pipeline handling technologies such as the 2-in., 4-in., and 24-in. pipeline tools from First Subsea.

The complete decommissioning of subsea pipelines involves the removal of seabed and buried pipelines. Traditional techniques such as cutting the pipeline, strapping, and pulling it to the surface work well for pipeline lying on the seabed. However, they are ineffective in removing pipeline buried under berms where the safe working loads and stresses on the pipe and recovery tool are too high. As a result, contractors are faced with either having to uncover the pipeline first and then lift it, a time-consuming and expensive process, or taking a new approach to extracting the pipeline from under the rock berms.

The First Subsea 2-in., 4-in., and 24-in. pipeline handling tools are designed for extracting rigid pipe buried under 1.5m of rock berm. The pipeline tools are based on the ball and taper connection principle used in mooring systems and pipeline recovery tools.

Briefly, ball and taper works on the simple principle of a ball engaged in a taper. The male connector is inserted within a female receptacle – it is self-energizing and self-aligning. As the male connector's balls roll up the tapers, the tightness of the grip increases in direct proportion to the load applied. In pipeline recovery and handling tools, the female receptacle is the pipeline.

The 4-in. and 24-in. pipeline handling tools use the male part of the ball and taper. Unusually for ball and taper technology, the balls on the 24-in. tool are hydraulically activated rather than spring activated. After the tool has been inserted into the pipe, an ROV "hot stabs" the tool's hydraulics to release and drive the balls onto the pipe's inner surface. Once load is applied, the balls "bite" into the pipe wall, creating a tear-drop shaped tapered indent. After the pipe has been dragged out from under the berms, the hydraulic activator is then "hot stab" deactivated, disengaging the balls, and the tool reused.

For smaller diameter pipes where the safe working load on the buried pipe is too great for a conventional ball and taper tool, First Subsea has reversed the normal ball and taper geometry in its 2-in. pipe extraction tool; the balls are positioned inside the tool. The company claims this is first ball and taper pipeline handling tool to grip the pipe on the outside rather than the inside. Protective external surface coatings often used on subsea pipelines can also be accommodated in the 2-in. tool design.

The 2-in., 4-in., and 24-in. tool designs are custom engineered reflecting the size, condition, and safe working load on the pipeline. This takes into account the hardness of the pipe material and maximum stress the pipe is able to withstand. The tools can be fitted with either a clevis head or padeye, allowing recovery of the pipe to the surface ship or to be left in wet storage on the seabed for subsequent removal.

The First Subsea 2-in., 4-in., and 24-in. tools have already been used successfully on recent pipeline decommissioning projects, including flexible pipes.

For more details on First Subsea's pipeline handling tools, e-mail info@firstsubsea.com or visit www.firstsubsea.com

New TSS Motion Sensor

Dynamic positioning (DP) system manufacturers have been quick to welcome the new DMS-500RP series of sensors.

The DMS-500 range has been developed specifically to meet the needs of users who require a top-quality motion sensor with Ethernet connectivity, but do not require the subsea-rated housings that typify Teledyne TSS products. The first phase of the product's launch has introduced the Roll Pitch range of sensors, including the DMS-525RP, the DMS-535RP, and the DMS-550RP. When the sensor range is complete, it will include conservatively priced instruments that incorporate advanced and innovative features for applications, such as DP, wave-height monitoring, and structural stress monitoring.

The versatile design of the DMS-500 series means that the range is available with various accuracies suitable for a wide variety of bespoke applications. The different models provide a highly reliable, accurate, and cost-effective choice for motion measurement with roll/pitch accuracies from 0.25° to 0.50° RMS with high dynamic accuracy during vessel turns.

The solid-state circuitry of the DMS-500 is contained within a surface-use housing that is water resistant to International Standard IEC 60945 Class B for marine applications (IP65). It is designed to be DNV-certified and uses solid-state angular rate sensors that offer reliability with an MTBF of more than 50,000 hours plus global availability due to the absence of any export restrictions.

For more information, visit www.tss-international.com.

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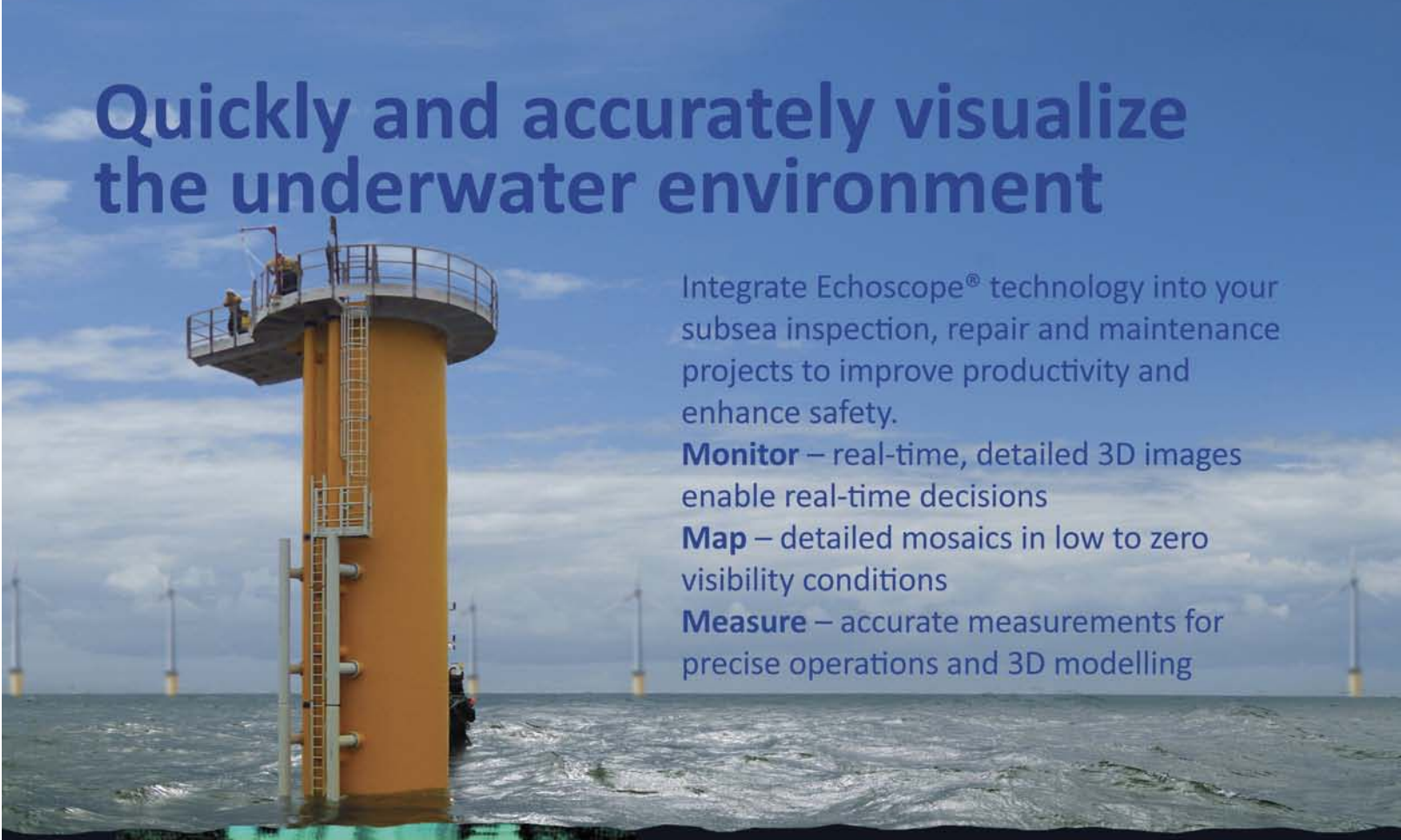

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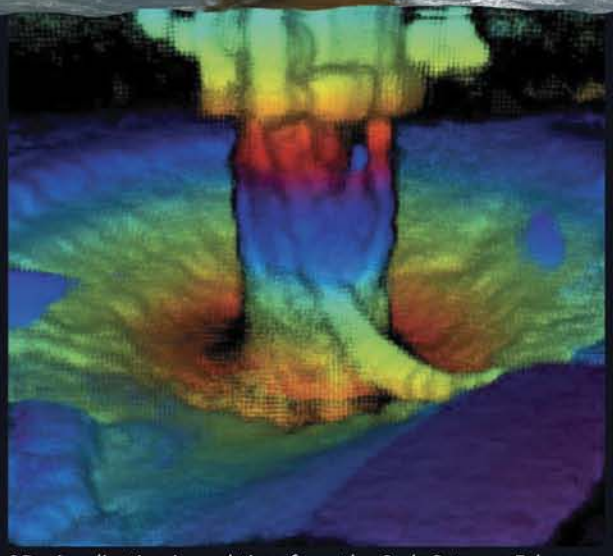

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CSnet's Offshore Communications Backbone (OCB) consists of a network of power and fiber optic cables and sensor ports connected to a surface communications buoy. The OceanNET™ buoy, was designed and built by Maritime Communication Services MCS, a subsidiary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

Expandable, Adaptable, Portable

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

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- Oil & gas exploration and site assessment
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- Pipeline and infrastructure security monitoring

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

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Useful Products introduces "VIC-LOK" shackle

Useful Products, distributed by IntegriCert, a load testing, inspection, and rigging company servicing the oil and gas industry, and Southwest, have introduced the patented "VIC-LOK" shackle, the strongest domestically forged shackle in the market.

The VIC-LOK is a captive, permanently attached shackle that improves safety by eliminating the possibility of using incorrect shackles. These shackles cannot be removed without being cut off or destroyed. This patent-pending design has a five-to-one load safety factor and is available in 1/2-in., 5/8-in., 3/4-in., 7/8-in. and 1-in. sizes. The shackles have certified load ranges from 3.5 tons for the smallest to 13 tons for the largest.

"The VIC-LOK is one of the first shackles designed to address the most common shackle-related safety concerns," said Vic Segura, IntegriCert president. "As shackles are often stored separately from the slings, we designed this permanently captivated shackle to eliminate the dangerous risk of shackles that are too small for the load or different sizes on the same sling, leading to an unbalanced lift."

The shackles meet the performance requirements of Federal Specification R-R C-27-1-D, Type 4-B, Grade A. It meets and exceeds A-S-M-E B-30.26 requirements. The entire series of VIC-LOK shackles have A-B-S and D-N-V "pull to destruction" test documents.

For more information, visit www.integricert.com.

New Mini HD/SD CVIS

Bowtech has supplied its first miniature High Definition Compact Video Inspection System (Mini HD/SD CVIS) to U-Boat Worx, a manufacturer of leisure submarines in The Netherlands.

The system was fitted to a C-Quester Type 3 Submersible.

Based on their highly popular CVIS-3 but occupying almost 70% less volume and weighing approximately 65% less, the unit controls a Surveyor HD camera and Pan & Tilt unit.

The Mini HD CVIS was specifically designed to meet the customers' requirements to be minimal (330mm x 234mm x 152mm), lightweight (approx 6kg); easy to use; controls zoom, focus, and iris functions of the camera as well as pan & tilt axis of the unit and intensity of underwater lamps; HD video display incorporating a compact state-of-the-art 6-in. HD monitor, and fiber optic video transmission.

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

ROVINS provides marine survey specialist with enhanced heave compensation

Calesurvey works with sister companies Calegeo and Calefleet to provide world-class marine survey and contracting services to the offshore energy and telecommunications industries.

Calesurvey was in the market for a superior motion sensor to use in conjunction with a variety of instruments, most notably an R2Sonic multibeam echosounder (MBES), onboard the Kommandor Stuart, the company's dedicated DP-2 geophysical survey vessel.

iXBlue proposed Calesurvey use one of its ROVINS units to provide the necessary input required by the MBES. ROVINS is based on iXBlue's innovative fiber optic gyroscope technology and is an underwater product intended for use by the offshore industry in water depths of up to 3,000m. The unit provides accurate position, heading and attitude data and combines a survey-grade, fully-featured, inertial navigation system (INS). Crucially, ROVINS displays the best heave accuracy in the market: 2.5cm or 2.5% of amplitude, whichever is lower.

This outstanding performance comes from using the SMART HEAVE™ algorithm, which intelligently filters the vertical acceleration data prior to integration and applies a 100s delay on the datastream, during which short-term motion history is taken into account, ultimately to provide the best possible heave output.

For more information, visit www.ixblue.com.

BlueView to develop the first full ocean depth multibeam imaging sonar for Virgin Oceanic and James Cameron

BlueView Technologies, the world leader in compact acoustic imaging and measurement technology, has been commissioned to develop the first full ocean depth (11,000m), multibeam imaging sonar systems for historic exploration projects by Virgin Oceanic and film director & National Geographic Explorer in Residence James Cameron (Avatar). The new imaging sonar systems will be integrated onto revolutionary manned and unmanned submersibles destined for the deepest locations on earth, including the Mariana Trench in the Pacific Ocean.

At more than 6 mi. deep the BlueView imaging sonar will withstand immense pressure, more than 8 tons per square inch. Using hundreds of razor-thin acoustic beams, the 2D imaging sonar system will aid real-time navigation, object detection and tracking, and monitor biologic activity by delivering and recording high-resolution sonar imagery and data in an environment absent of visible light.

Explorer Chris Welsh approached BlueView Technologies to develop the unique multibeam system to support the Five Dives Expedition sponsored by Virgin Oceanic. World renowned film director/producer James Cameron will also use the system to explore the Mariana Trench in a separate expedition to film this unique location in 3D and uncover its mysteries.

For more information, visit www.blueview.com.

New ROS 36:1 camera

Remote Ocean Systems (ROS) has introduced the Spectator 36:1 color zoom camera that offers 36:1 optical zoom with autofocus. The camera has an outstanding 88° field of view in water and a titanium housing rated to 4,000m.

For more information, visit www.rosys.com.

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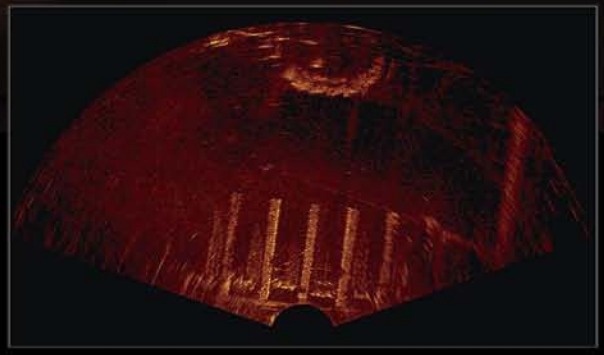

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OSIL design ROV-triggered water sampling system

OSIL has supplied a unique water sampling system of innovative design for use in the offshore oil industry.

OSIL were approached by a well known oil major to assist with a unique water sampling requirement off the West African coast. The system was required to retrieve multiple samples, with space for a CTD probe (or similar instrument to collect background data), and had to be fitted to and operated by ROV under difficult conditions. The samples were to be collected at fixed depth and had to be collected in conjunction with other ROV samples.

This prevented the use of traditional wire water sample collection methods, due to the risk of entanglements.

OSIL used the industry standard Niskin bottle due to its robustness and designed a sampling system to secure 6 primed 5L Niskin bottles, with space for an AML Oceanographic CTD Plus V2 in the center of a stainless steel frame, which could then be mounted to the ROV.

The system is being used off the coast of Nigeria in the exploration for offshore oil.

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

Valeport advances subsea distance measurement with new altimeter

Leading oceanographic instrument manufacturer, Valeport, is delighted to announce its latest innovation, the VA500 Altimeter. The VA500 is launched this month and introduces advanced new technology for underwater positioning in offshore applications.

The VA500 uses a state-of-the-art signal processing system with a 500 kHz broadband transducer to provide stable, repeatable readings to a resolution of 1mm over a range of 0.2m to 100m. The system takes a significant step forward in performance for a 500 kHz altimeter.

With a wide range of power supply options and both analog and digital outputs, the VA500 offers great flexibility for

Hyperbaric Monitoring.

DDC image courtesy of LeeMar Engineering Pte Ltd

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the needs of the ROV, AUV, and hydrographic community. Digital RS232 and RS485 interfaces, as well as analog 0 to 5V and 0 to 10V outputs are fitted as standard. The VA500 will interface to the Valeport Bathypack and those of other manufacturers.

As an option, the VA500 may be fitted with a high accuracy (0.01%) pressure sensor, as used in Valeport's MiniIPS (Intelligent Pressure Sensor), which offers an unbeatable package for all underwater positioning requirements.

As with all Valeport's products, the VA500 is sealed in a robust titanium package as standard in order to eliminate the corrosion issues associated with lower cost metals. Both OEM and right-angled package configurations are also available on request.

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

Pommec expands Osiris Marine Services diving capacity

Pommec, rapidly becoming the leading manufacturer of Launch and Recovery Systems (LARS), has been awarded the contract by Osiris Marine Services to deliver two complete LARS Lite and the first produced Twin Basket LARS for their projects in the wind farm industry.

Osiris Marine Services specializes in providing subsea engineering, ROVs, surveying, commercial diving, tower teams, and confined space solutions to the renewable energy and civil engineering markets on an international scale.

With these fully Lloyd's certified LARSs Osiris Marine Services can safely expand their projects further offshore, and, most importantly, on more demanding projects from DP vessels.

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2012 EDITORIAL CALENDAR

January/February
Editorial: Inspection & Light Work Class ROVs, Oceanography & Meteorology
Distribution: NACE • Oceanology International
Deadline: January 15th
Product Focus: Diving Equipment & Buoyancy Materials

March
Editorial: Defense & Naval Systems, Maritime Security
Distribution: MCE Deepwater Development, France
Deadline: February 15th
Product Focus: Navigation, Mapping & Signal Processing; Diver Detection Systems

April
Editorial: Offshore Technology
Distribution: Global Marine Renewable Energy • OTC
Deadline: March 15th
Product Focus: Connectors, Cables & Umbilicals

May
Editorial: Offshore Wind, AUVs & Gliders, UW Imaging & Processing
Distribution: UDT Europe • Anti-Submarine Warfare • OceanTech Exp • AWEA Offshore Wind
Deadline: April 15
Product Focus: Cameras, Lights & Imaging Sonars

June
Editorial: Workclass ROVs, Wave & Tidal, Ocean Observing Systems
Distribution: EnergyOcean International
Deadline: May 15th
Product Focus: Subsea Tools & Manipulators

July
Editorial: Offshore Mooring, Subsea Fiber Optic Networks
Distribution: Deep Gulf • Offshore Northern Seas
Deadline: June 15th
Product Focus: Tracking & Positioning Sys, Seismic Monitoring

August
Editorial: Ocean Mapping & Survey, Subsea Telecom, Deepwater Pipeline & Repair/Maintenance
Distribution: Mast Europe
Deadline: July 15th
Product Focus: Multibeam & Side Scan Sonars

September
Editorial: Coastal Engineering, Acquaculture & Marine Resources, Environmental Assessment & Monitoring
Distribution: Oceans MTS/IEEE • Ocean Innovation
Deadline: August 15th
Product Focus: Buoys & Monitoring Instrumentation

October
Editorial: Offshore Communication, Offshore IRM, OTEC
Distribution: Offshore Communications • Subsea Survey IRM • Clean Gulf
Deadline: September 15th
Product Focus: Acoustic Modems, Releases & Transponders, Marine Communications

November
Editorial: Offshore Vessels, Commercial Diving, Decommissioning, Plug & Abondonment
Distribution: International Workboat Show
Deadline: October 15th
Product Focus: Workboats, Diving Systems

December
Editorial: Year in Review, Company Showcase
Distribution: TBA
Deadline: November 15th
Product Focus: Handling Equipment, Winches & Control Systems, Battery Technology

People & Company News

Underwater Centre in Tasmania has appointed **Allan Brown** as general manager to oversee a period of significant investment in the subsea training facility. He joins the Tasmanian Underwater Centre from its sister base in Fort William, Scotland, where he was general manager for 2 years and is credited with helping to increase revenues, amid additional investment to enhance every aspect of the Centre's operations.

Brown

Oscar Lopez joins T&T Bisso as an assistant project manager and on-site coordinator, bringing more than 10 years of experience in salvage logistics support and project management. After serving on active duty in the U.S. Army, Lopez began his maritime career as a salvage diver for Titan Salvage in Fort Lauderdale, Florida, quickly moving to take over the management of Titan's ocean going jack-up barge fleet as well as acting as on-site project coordinator on international salvage operations. Lopez also served as salvage warehouse manager and project manager for Resolve Marine Group in Mobile, Alabama. As a certified project manager, Lopez will be supporting the on-site management needs of T&T Bisso's growing salvage and wreck removal business around the world.

CHC Helicopter is undergoing a major restructure and series of strategic appointments within its senior management team in Aberdeen to support the existing customer base and grow its key markets. **Nick Mair** was appointed regional vice president for the Western North Sea division following the integration of CHC's European and global operations into a single helicopter services division. Tasked with leading CHC's business units in Aberdeen, Humberside, North Denes, Den Helder in the Netherlands and Esbjerg in Denmark, he will also oversee the search and rescue bases in Ireland and the UK. Further senior changes in Aberdeen include the promotion of **Rob Pendle** to vice president of maintenance and technical services and the appointment of **Dave Stewart** as finance director. **De Jansen** was appointed director of flight standards based in the Netherlands. His former post, business unit leader for the Southern North Sea, will be filled by **Paula McKenzie**. Both have worked from CHC's North Denes base in the east of England for a number of years.

Tim Eyles became the managing director of the 2H Offshore group of companies. He will also continue to share the running of 2H Offshore's engineering office in Woking, UK. At the same time, **David Walters**, joint leader of the company's Houston, U.S., office, was added to the 2H Offshore global management team as a principal director.

Apache Corp. appointed **William C. Montgomery**, a managing director of Quantum Energy Partners, a private equity firm that focuses on investments in the energy and power industries, to its board of directors.

ConocoPhillips has chosen the leaders for the two independent energy companies that will result from the previously announced strategic repositioning of ConocoPhillips. **Ryan M. Lance** will become the chairman and chief executive officer of ConocoPhillips, the upstream company, and **Greg C. Garland** will become the chairman and

chief executive officer of the downstream company. **Jim Mulva**, the current chairman and chief executive officer of ConocoPhillips will retire subsequent to completion of the separation.

CDL Inc. has announced that **Julian Rickards** has officially joined the CDL team in the position of Business Development Manager, Americas.

Kongsberg Maritime AS, a wholly-owned subsidiary of Kongsberg Gruppen ASA, completed the acquisition of **Evotec AS** on Friday, 30 September. Evotec AS develops and delivers technological management systems for the seismic, subsea, and supply markets, among others.

SMD and **Blade Offshore Services (BOS)** are pleased to announce the signature of Heads of Terms for a joint venture. Under the joint venture, expected to be called SMD-BORD, SMD will design and manufacture subsea remote drilling solutions for the marine renewable industry, offering a cost-effective alternative to monopile and gravity foundations for wave, tidal, and wind devices.

EdgeTech and affiliate **ORE Offshore** have recently added another 7,500 sq. ft. of manufacturing and office space to their Massachusetts facility. The new space will be used to supplement the factory floor, which already houses a wide array of manufacturing bays and test facilities, including pressure chambers, acoustic test tanks, and transducer clean room operations.

BlueView Technologies, a world leader in compact acoustic imaging and measurement technology, has added **Beto Campos** as director, global commercial sales and business development. Campos will manage and develop BlueView's sales efforts in the ROV, port security, salvage, search & recovery, fisheries, and education segments worldwide.


Kreis

BIRNS, Inc. has appointed **Catalin Kreis** as its new Marketing Communications Executive. In her new position, Kreis will be responsible for spearheading the BIRNS social media program, providing creative direction and overseeing operations for trade shows, and coordinating with the sales department as a customer liaison.

Calendar

Nov. 30 - Dec 1, 2011:
Clean Gulf
San Antonio, TX
www.cleangulf.org

Nov. 30 - Dec. 2, 2011:
International Workboat
New Orleans, LA
www.workboatshow.com

December 6-8, 2011:
Wind Turbine Blade Manufacture 2011
Cologne, Germany
www2.amiplastics.com/Events/Event.aspx?code=C420&sec=1786

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

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

March 13-15, 2012:
Oceanology 2012
London, UK
www.oceanologyinternational.com

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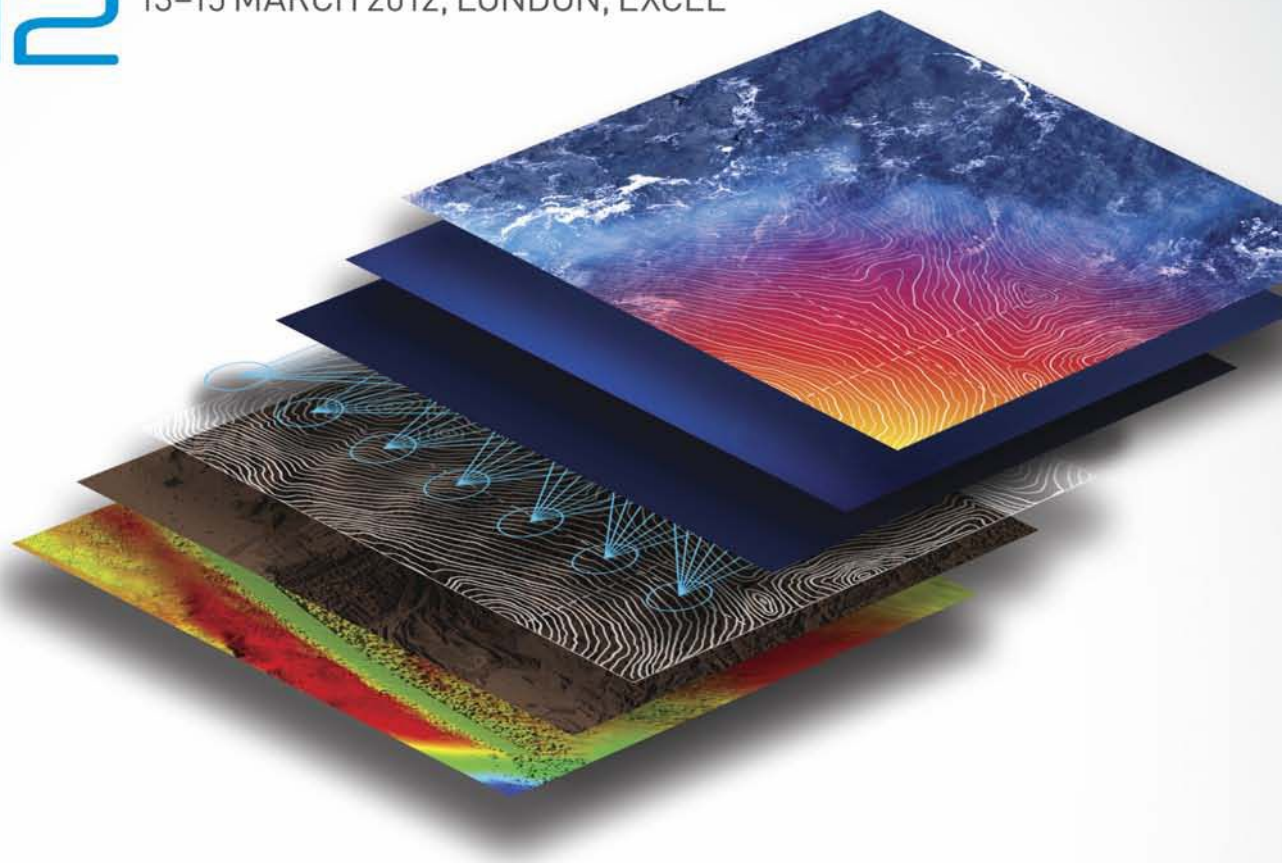

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CABLE PROTECTION

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. EVERGRIP™ Termination: provides a full-strength field installable termination providing a high quality strength 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
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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 HydroVolt line of connectors is the most rugged and reliable low cost connector available. AK Industries is also ideally suited to provide unique solutions engineered to customer requirements.

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

BIRNS Aquamate LLC
558 Mineral Spring Ave. Unit BF-127
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).

SEA CON®
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El Cajon, California 92020 USA
Tel: (619) 562-7071, Fax: (619) 562-9706
E-mail: seacon@seacon-usa.com
Website: www.seaconworldwide.com

The SEA CON® Group of companies are leaders in underwater connector technology and provide an extensive and diverse range of electrical, optical and hybrid connector assemblies, submersible switches and cable system solutions for many applications within the oil and gas, defence, oceanographic and environmental markets. With locations in California, Texas, Rhode Island and Florida in the USA, Brazil, the UK and Norway as well as a worldwide network of agencies and representatives, SEA CON® is able to provide quick solutions with either existing or custom designed products across the globe.

CONNECTORS Continued

Subconn Inc // M.J. Stewart Associates Inc.
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North Pembroke, MA 02358
Tel: 781 829 4440, Fax: 781 829 4442
Mobile 781 361 2723
Website: www.subconn.com
Contact: Mike Stewart

SubConn® Inc has been supplying the world's leading range of underwater pluggable electrical connectors to the demanding underwater industry for over 30 years. The range is trusted by customers worldwide for shallow water use to full ocean depth rating. The latest underwater Ethernet series is a high speed underwater communications system with true Ethernet type performance. The unique cable system is based on industry standard SubConn® connector systems and can operate in full ocean depth applications. The new SubConn® combined power and Ethernet cable provides data transfer and power for underwater instruments in one high performance cable.

Teledyne ODI- A Teledyne Technologies Company
1026 North Williamson Boulevard,
Daytona Beach, Florida 32114
Toll Free: (888) 506 2326
Tel: (386) 236 0780, Fax: (386) 236 0906
E-mail: ODI_marketing@teledyne.com
Website: www.odi.com

A leader in subsea electrical & fiber optic interconnect systems. Wet-mateable connectors include signal & high-power electrical, optical, and hybrid products. All based on patented PBOF technology. These rugged components are designed for use at any ocean depth, in the harshest environments. ODI also provides top quality custom engineered solutions for any subsea networking challenge.

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Website: www.teledyneoilandgas.com.

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Contact: Carolyn Jones
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LIQUID STORAGE

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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.

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OCEANOGRAPHIC INSTRUMENTS

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Website: http://www.seabird.com
Contact: Calvin Lwin, Applications Engineering

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OCEANOGRAPHIC INSTRUMENTS — Continued

STAR : ODDI

Star-Oddi
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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
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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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*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 compliments the brokerage side of the business. MaRE also provides **Consultancy** on all aspects of remote underwater technology.*

SONAR SYSTEMS

Imagenex Technology Corp.
209-1875 Broadway St., Port Coquitlam
BC, Canada, V3C 4Z1
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 SportScan and the YellowFin, feature a revolutionary price/performance ratio. For more information please visit www.imagenex.com

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

- STD/CTD, Sound Velocity probes/recorder with optional multi-parameter facilities; Turbidity, Fluorescence, Oxygen etc.
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SUBSEA FABRICATION

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E-mail: sales@seacon-ap.com
Website: www.seacon-ap.com

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TRANSDUCERS

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UNDERWATER THICKNESS GAUGES

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E-mail: sales@cygnusinstruments.com
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Contact: Rod Sanders

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ROVS

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Forum Energy Technologies' Perry Slingsby brand supplies deepwater work class ROVs, tooling solutions, burial systems, and control-system-based products to the oil, gas, and telecommunications industries. Providing the most advanced, robust and dependable ROVs and subsea products in the world, Forum's Subsea group has facilities in the US and UK and sales offices and agents around the world.

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SeaBotix Inc. is the world leading manufacturer of capable MiniROV systems. The Little Benthic Vehicle range of systems have become the benchmark in compact ROVs around the world. All systems perform a multitude of tasks including maritime security, body rescue, sensor deployment, object recovery, hazardous environment intervention, and hull inspection.

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E-mail: sales@sub-atlantic.com
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Forum Energy Technologies' sub-Atlantic brand manufactures world class ROVs ranging from portable units to light work class systems. Sub-Atlantic also supplies thrusters, hydraulic power units, valve packs, compensators and pan and tilt systems to other ROV manufacturers. Sub-Atlantic is part of the FET subsea group and has facilities in the US and UK and sales offices and agents around the world.

Submersible Systems Inc.
333 Progresso Road
PO Box 1843
Patterson, LA 70392
Tel: 985-395-0999, Fax: 985-395-0995
Website: www.ssirovs.com
Contact: Wolfgang Burnside

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Tel: (610) 458 3000, Fax: (610) 458 3010
E-mail: info@videoray.com
Website: www.videoray.com
Contact: Brian Luzzi

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UUVS

iRobot Corporation | Maritime Systems
4625 Industry Lane
Durham, NC 27713
Tel: 919-405-3993, Fax: 919-495-3994
E-mail: frochleder@irobot.com
Website: www.irobot.com
Contact: Friedrich Rochleder, Sales Account Manager

iRobot designs and builds robots that make a difference. iRobot's family of unmanned underwater vehicles (UUVs), including the iRobot 1KA Seaglider and iRobot 15A Ranger, perform a variety of missions for researchers, oceanographers and military planners including physical, chemical and biological oceanography, persistent surveillance, marine environmental monitoring and other missions.

UNDERWATER VIDEO EQUIPMENT

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Shady Side, Maryland 20764
Tel: 443-951-1044x100
E-mail: sales@hadaltech.com
Website: www.hadaltech.com

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Camera Division
Campus 1, Science & Technology Park,
Balgownie Road, Bridge of Don,
Aberdeen, AB22 8GT, UK
Tel: +44 (0)1224 226500
Fax: +44 (0)1224 226598

E-mail: km.camsales.uk@kongsberg.com
Website: www.kongsbergmaritime.com
Contact: Bill Stuart

Kongsberg Maritimes's Camera Division in the UK has been designing and manufacturing underwater cameras for over 30 years and is the recognized market leader in supplying underwater imaging technology to the offshore oilfield industry. It also has a 20-year history in supplying the international naval defense sector, with special camera systems.

SIDUS Solutions, Inc.
San Diego, CA Office:
Tel: (619) 275 5533, Fax: (619) 275 5544
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Tel: (281) 596 7568, Fax: (281) 596 7578
E-mail: info@sidus-solutions.com
Website: www.sidus-solutions.com

SIDUS Solutions, Inc. is an integrated systems provider for security and video surveillance systems specializing in customization. Our products are operational to subsea depths of 6,500m, serving industries worldwide. We are a full-service provider, offering complete end-to-end solutions from concept design, product selection, engineering, manufacturing, technical and customer support.

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Website: www.hawboldt.ca
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E-Mail: johanns@rappus.com
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WINCHES - UNDERWATER

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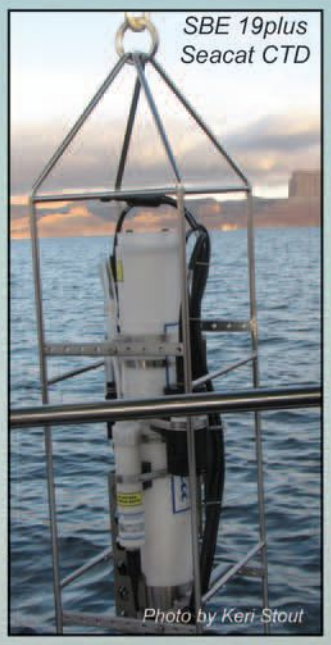

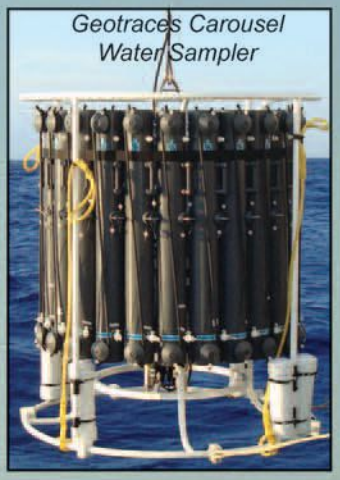

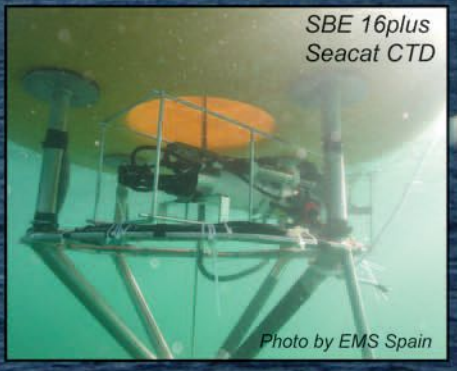

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