Ocean News & Technology

August 2014 www.oceannews.com

A Worldwide Survey of Recent Ocean Observatory Activities: 2014 Update

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Technology of the DEEPSEA CHALLENGE Expedition (Part 3 of 3: DEEPSEA CHALLENGER)

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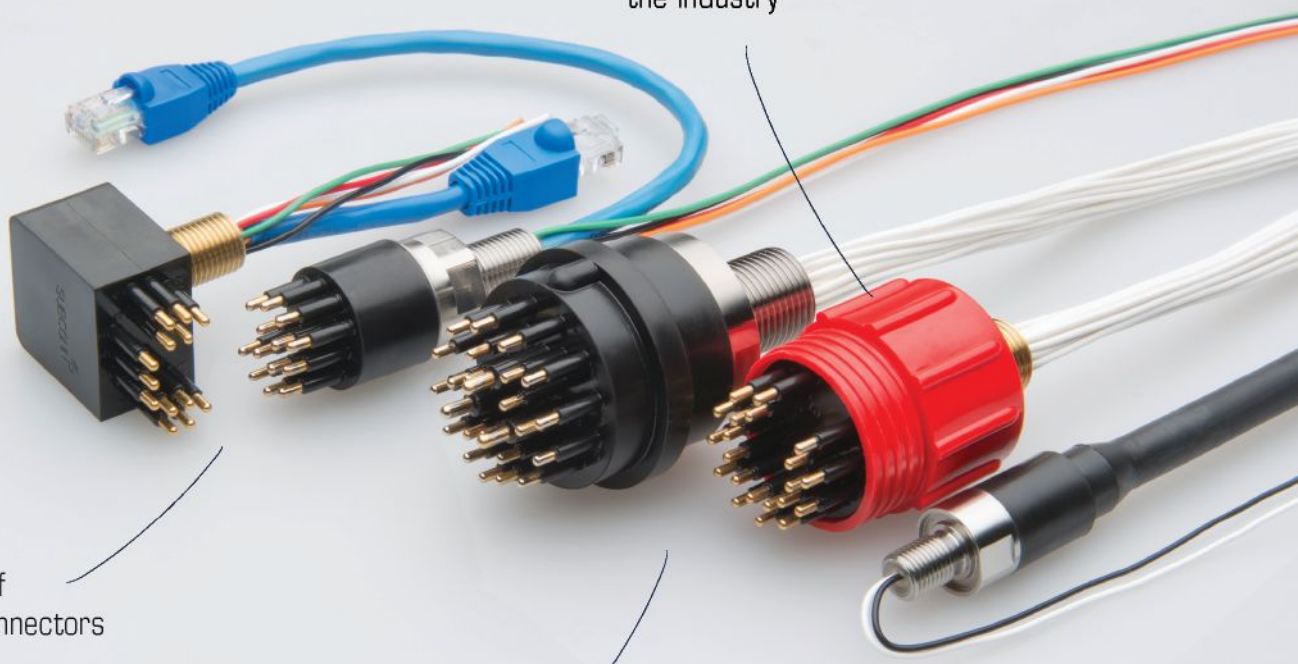

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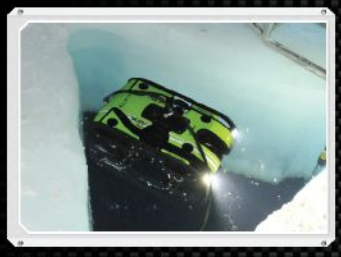

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The hadal submersible ***DEEPSEA CHALLENGER*** is photographed in the darkness at 850m off Ulithi Atoll, FSM, March 2012. Photo by Larry Herbst. Used with permission, Earthship LLC.

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CIRCULATION
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subscriptions@ocean-news.com

ADVERTISING SALES

SR. V.P./ SALES & MARKETING
MJ McDuffee
Tel: +1 (772) 617 6836
Fax: +1 (772) 221 7715
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NORTH AMERICAN AD SALES:
Lisa Chilik
Tel: +1 (574) 261 4215
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TEXAS/LOUISIANA AD SALES:
Amy Dukes
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INTERNATIONAL AD SALES:
Zinat Hassan
Tel/Fax: +44 (0) 845 6522 483
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Mimi Shipman
Mob: +44 (0) 777 6017 564
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U.S. IOOS addresses sea level rise in Hampton Roads

By Ray Toll – Vice President, Industry and Technology, Marine Technology Society CAPTAIN, USN, RET

The Hampton Roads region with its seven cities and 265 municipalities has been identified by the White House and Pentagon for a pilot project to address sea level rise. A combination of factors such as subsiding land and rising sea levels due to global warming and the slowing of the Gulf Stream make Norfolk and surrounding area one of the most vulnerable to flooding in the country.

Integrated ocean observing has been identified has a key priority in this 2-year Hampton Roads regional sea level rise pilot project that was rolled out at a Marine Technology Society TechSurge at Old Dominion University on 3 June 2014 in Norfolk, Virginia. This project will be developed using a "whole of government" approach to tackling the complex inter-governmental challenges of preparing for the impact of climate change and sea level rise. As evidenced by the body of work already underway, the Hampton Roads region is an ideal location for this kind of a pilot program that will explore the complexities of military base and community preparedness and resilience when confronted with the effects of climate change and sea level rise.

The pilot will first baseline the regional network already in place and then focus on ways to improve upon that network. In the second year the Regional Interagency Task Force will focus on development of a preparedness and resilience plan for sea level rise, assessment of decision support tools, developing proposals for policy and legislative changes that would remove barriers to regional interagency cooperation and enhance planning efforts, and identification of information and analytical support that Federal agencies can provide to regional planning efforts. Simulations and table top exercises will be used to develop and test interagency coordination processes and procedures and identify critical planning factors that should be included in a regional preparedness and resilience plan.

The pilot leadership team sees the development of a regional integrated network of sustained sea level observations as a requirement for implementation of effective and sustained mitigation and adaptation measures. On 3 June 2016, the Hampton Roads Sea Level Rise Preparedness and Resilience Intergovernmental Planning Task Force will stand up as the permanent regional planning body to accomplish this mission over the long term.

Ray Toll is a retired Navy Captain, and has worked in the fields of Meteorology and Oceanography since 1978. He received his Bachelor of Science in Meteorology from the University of Utah in 1978, and Masters of Science in Meteorology and Oceanography from the Naval Postgraduate School in 1986. He has authored several papers on the Navy's Operational Global Atmospheric Prediction System (NOGAPS).

Since 2004, Toll has worked in industry (SAIC as NOAA Account Manager and Computer Sciences Corporation on the NDBC contract), and is currently employed by the Old Dominion Research Foundation. He serves on several panels and organizations supporting and advocating for a sustained, operational ocean observing capability.

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REAL-TIME OCEAN OBSERVING SYSTEMS WITH INDUCTIVE MODEM TELEMETRY TECHNOLOGY

By: Debbie Bresko, David Murphy

Real-time ocean observing systems provide critical information for the study of ecosystems, water quality, and fisheries, as well as data for long-term climate change studies. The development of satellite, RF, and cellphone telemetry has made real-time, unattended, remote oceanography increasingly practical. However, before these telemetry techniques can be exploited, the data from underwater instruments must first be brought to the surface.

Traditional real-time moorings required breakouts for direct cable connections to instruments, with a potential for failure at each of the breakout locations. Furthermore, because the location and type of each instrument on a mooring line is fixed once the cable is manufactured, these systems lack the flexibility to adjust instrument locations and types once deployed. Real-time data from these systems could hint at interesting phenomena occurring between instruments on the mooring, but without the ability to reposition the instruments the details would not be captured. Utilizing an Inductive Modem (IM) system for the mooring provides reliable, real-time data transmission for up to 100 instruments that can be positioned or repositioned at any depth. IM moorings use standard plastic-jacketed wire rope as both the transmission line and mooring tension member. IM systems are more power-efficient than acoustic modems and offer reliable communication over greater distances.

The first Sea-Bird IM systems, utilizing SBE 37-IM MicroCAT CT and CTD instruments, were deployed in the western Pacific in 1998 by JAMSTEC (Japan Agency for Marine – Earth Science and Technology) for the Triton array. The Triton array is still in operation today and continues to use IM telemetry to deliver real-time data from sensors placed at depths up to 750 m on a 4,000-m mooring. The present buoy configuration includes 11 Sea-Bird MicroCAT CT and CTD instruments programmed to take a measurement every 10 minutes and report an hourly mean to the buoy controller via the IM system. More information on Triton is available at http://www.jamstec.go.jp/jamstec/TRITON/real_time/. More than 3,000 Sea-Bird IM instruments have been deployed worldwide in the ensuing 16 years.

Technical Details

An inductive modem uses electrical current loops to transmit information; current flowing in a wire loop induces current to flow in a loop that passes through it. In Sea-Bird's IM system (Figure 1), the first loop is formed by the coupler connection of the surface buoy to the mooring cable. The second loop is formed by the mooring cable and the seawater; the cable is bare metal on the top and bottom and insulated in the middle. The third loop is at each underwater instrument. Because all coupling is done in loops, no cable breakouts are required. Each coupler is made up of two halves, allowing it to clamp around the cable, so the cable does not need to be threaded through the unit. For typical saltwater applications, the maximum transmission length is approximately 6,000 m. In fresh water, with its lower conductivity, good communications can be obtained over 1,000 m with conductivity as low as 100 microSiemens/cm.

The IM system supports both autonomously operating instruments and those that require a command to take a measurement and return the data. The communications link is one way, meaning that if the surface modem is transmitting to the instruments, then the instruments must all be listening. Conversely, if one of the instruments is transmitting, then the surface modem must be lis-

Figure 4. Deployment of SBE 37-IMP-ODOs on IM mooring in Baltic Sea for Finnish Meteorological Institute (photo by Heini Jalli, FMI)

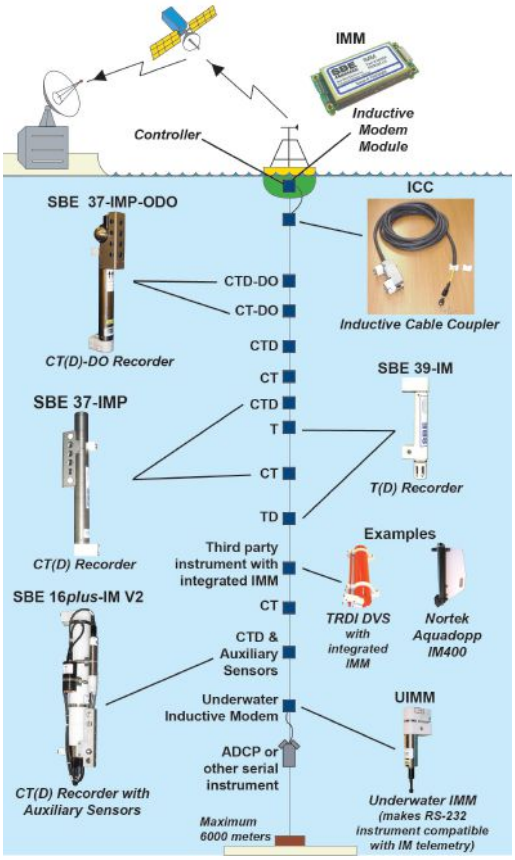

Figure 1. Schematic of an IM system

tening. Global commands to take and store a measurement can be sent to all instruments on the mooring line. Each IM instrument is pre-programmed with an ID; data are acquired by sending a command to the individual instrument to transmit its data to the buoy controller.

The IM system can accommodate a wide variety of instruments for nearly any type of measurement. Sea-Bird manufactures IM versions of a number of instruments, measuring various combinations of temperature, conductivity, pressure, dissolved oxygen, and data from integrated auxiliary sensors (Figure 2). Also available is an Underwater Inductive Modem Module (UIMM) that allows instruments from other manufacturers to be integrated with an IM system; the UIMM includes electronics for buffering and storing data and a built-in inductive cable coupler and cable clamp; an RS-232 serial output instrument simply plugs into the UIMM end cap. An Inductive Modem Module (IMM) and a cable coupler can also be integrated in RS-232 serial output instruments at the development stage.

Figure 2. SBE 16plus-IM V2 SeaCAT CTD integrated with SBE 63 Optical Dissolved Oxygen Sensor and WET Labs ECO-NTU and ECO-PAR sensors with Bio-wipers™

Recent Field Experience

Sea-Bird's IM system was recently used in dredge monitoring for the Fehmarn Belt Fixed Link project (Figure 3). Anders Jensen, business area manager for survey and monitoring for DHI, stated, "We built our buoy systems for the Fehmarn Belt Fixed Link project with WET Labs WQMs and Sea-Bird Inductive Modem technology, with great success...As a full-service provider of marine environmental-monitoring systems, DHI expects and our clients demand reliability. We build our buoys to provide this with near real-time delivery of data to the web and data redundancy in the instruments on the buoy as back up. DHI's Aquaguard controller communicates with the instruments using Sea-Bird's Inductive Modem technology, which has been the key to providing robust communication capability. Data transmission from the monitoring site assures our clients that their monitoring program is meeting their specifications and saves time and effort for everyone by reducing servicing trips." Live data from a DHI monitoring buoy at Storestrømmen in Denmark is available at http://datacenter.dhi.dk/storstrom/.

Figure 3. Inductive Mooring line, before deployment for Fehmarn Belt Fixed Link Project (photo by DHI)

The Finnish Meteorological Institute (FMI) deployed an IM system in the Baltic Sea near Utö Island (Figure 4). Tero Purokoski of FMI stated, "Oceanographic measurements at the Utö (http://en.ilmatieteenlaitos.fi/uto) have been conducted since 1900. Traditionally, the data has been used for monitoring climate change and variability in the Baltic Sea, but now the Station is also part of the European Integrated Carbon Observation System (ICOS). One of the science questions examines the role of the ocean physical processes on atmosphere-ocean gas exchanges. The data is also assimilated into operational oceanography models, improving our forecasting skill for the Baltic Sea."

FMI's system consists of a surface buoy with SST sensor, GPS, controller and Iridium satellite connection. Underwater are SBE 37-IMP CT (4), SBE 37-IMP CTD (1), and SBE 37-IMP-ODO CTD with integrated optical dissolved oxygen (2) instruments. The CT and CTD instruments take a measurement every 5 minutes, the CTD-DO instruments take a measurement every 30 minutes, and the controller queries for data from the last measurement every 30 minutes. The surface buoy has enough battery power to operate for 12 months of uninterrupted data collection.

Summary

Real-time observing systems provide vital data for analyzing the ocean and inland waters. Inductive Modem systems provide reliable, flexible, low-cost, real-time data transmission for a wide variety of underwater instruments, including most RS-232 output instruments. For more information on IM systems, please visit www.seabird.com and see Application Note 92.

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[Figure 1 - EXO2 Platform]

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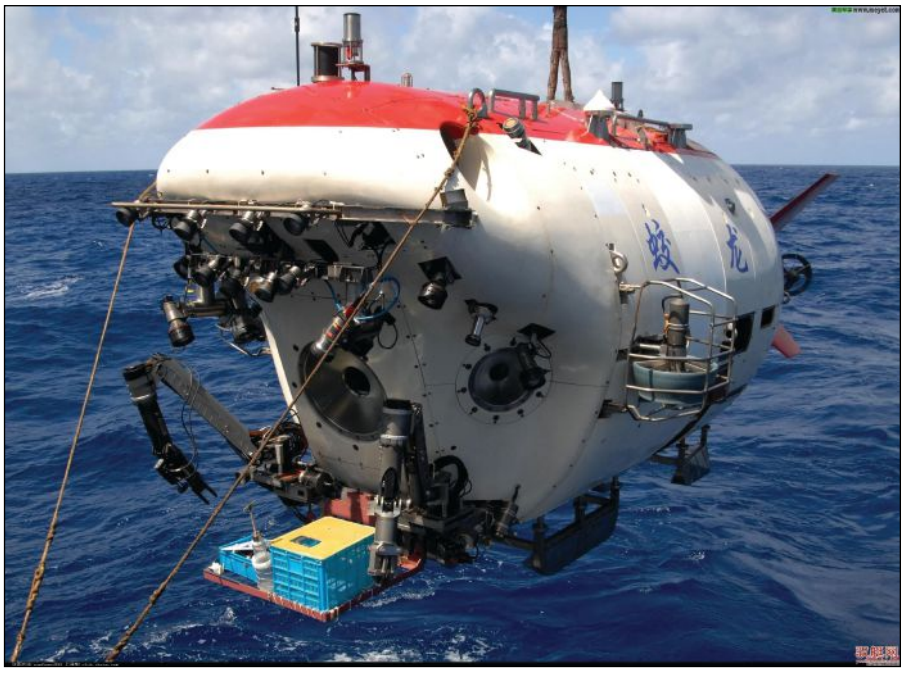
China's Jiaolong on Pacific voyage



The Jiaolong, China's first manned deep-sea submersible, began a voyage in the northwest Pacific Ocean on 4 July, according to the State Oceanic Administration's (SOA's) North China Sea Branch. During the 40-day voyage, the Jiaolong will conduct research on cobalt-rich crusts and life forms inhabiting the bottom of the sea, according to the SOA branch.

A micro-sized remotely operated underwater vehicle called "Longzhu," or "Dragon Ball," will also be carried by Jiaolong for the mission. It will be used to photograph the submersible underwater and carry out operations in areas too small for the full-sized manned submersible.

The branch has sent 45 members of staff on the mission. Most of them have been on previous Jiaolong missions. The deep-sea submersible reached 7,062 m in the Pacific's Mariana Trench in a dive in June 2012. During a trial and exploration voyage from June to September 2013, it explored the South China Sea and the northeast and northwest of the Pacific, accomplishing 21 dives.

Folling this voyage, Jiaolong is scheduled for another mission starting later this year in the southwest Indian Ocean to carry out scientific research on polymetallic sulfides.

Odyssey receives updated assessment of Oceanica resources deposit

Odyssey Marine Exploration, Inc., a pioneer in the field of deep-ocean exploration, has received an NI 43-101 compliant "Technical Report: Revised Assessment" that concludes the measured and indicated phosphorite resources at the Oceanica deposit now total 327.2 million ore tons at 18.5% P2O5, an increase of 20% over the last preliminary assessment total of 273.5 million ore tons.

An independent Qualified Person (QP) produced the updated report, which provides an extensive preliminary evaluation of a portion of the mineral deposit controlled by Odyssey's subsidiary, Oceanica Resources, S. de. R.L. However, the report does not yet include an evaluation of the entire deposit, rather only data derived from 199 drill holes, which have been tested and analyzed to date. This compares to 161 drill holes previously analyzed. The samples do not include concession areas where testing has not yet been conducted nor areas below the core sample depth where the core ended with full mineralization. Thus, additional test-

2014 MATE international ROV competition results

The 2014 MATE international ROV competition took place June 26-28 at the Thunder Bay National Marine Sanctuary in Alpena, Michigan. A record 59 teams from 18 U.S. states and 13 countries participated. More than 100 working professionals volunteered their time as judges and technical support. The Thunder Bay National Marine Sanctuary staff and the City of Alpena provided a tremendous amount of support as well as a warm welcome to the community. The teams that took home the top trophy in the Explorer class was Jesuit High School (second year in a row!), Carmichael, California. The top team in the Ranger class was Clarenville High School, Clarenville, NL, Canada. A summary of the award winners and prize sponsors as well as the final scores can be found at www.marinetech.org/scoring.

Fugro provides survey vessel to support search for Malaysia Airlines flight 370

The Australian Transport Safety Bureau (ATSB) has awarded Fugro a contract that will see the deployment of its specialist vessel, equipment and expertise in the underwater search for the missing Malaysia Airlines flight 370. Using its advanced survey vessel, the Fugro Equator, fitted with state-of-the-art multibeam echosounder equipment, Fugro will conduct a bathymetric survey of the search area. The seabed data obtained will assist in the production of maps of the seabed offshore Western Australia. This area is relatively uncharted and the maps will assist in planning subsequent stages of the MH370 search.

Costa Concordia refloated

After 2 and a hlaf years and nearly $1 billion, the salvage team have confirmed that the Costa Concordia refloating operation has completed successfully. Next, the 114,500 ton ship will be towed away from shore and moored before eventually being scrapped. Air was pumped into 30 tanks attached to both sides of the 290 m ship which rased her 2 m off the artifical platform where she rested since September.

Teledyne Invests in Ocean Aero

Teledyne Technologies Incorporated announced that it has invested in and entered into a strategic partnership with Ocean Aero, Inc. Based in San Diego, California, Ocean Aero is designing an unmanned surface vehicle that will also have the ability to descend subsea. Terms of the transaction were not disclosed.

ing is expected to increase the measured and indicated phosphorite resources in the deposit, and updates will be provided when completed.

Over 760 total core samples have been tested by the Florida Industrial and Phosphate Research Institute, a highly respected, independent, not-for-profit phosphate and fertilizer research center based in the U.S.

Phosphate is a key and irreplaceable component of fertilizers, and the location of this deposit makes it an attractive potential sourcing site for fertilizer companies in the Americas, Pacific Rim and Asia. The relatively shallow depth of the deposit and minimal to no overburden will allow the use of existing standard dredging ships and equipment.

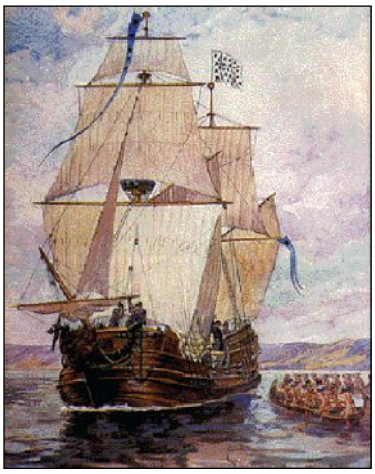
For more information, visit www.odysseymarine.com.

Historic shipwreck discovered

Steven Libert, president of the Great Lakes Exploration Group, announced he has located what is believed to be the remains of Le Griffon, the first European ship to have sailed the upper Great Lakes. The 45 ton barque carrying seven cannons was built by the legendary French explorer Rene-Robert Cavalier, Sieur de La Salle who was attempting to establish a Northwest Passage through Canada. On its maiden voyage the ship sailed through unchartered waters across Lake Erie, Lake Huron, and Lake Michigan. On its return trip Le Griffon and her crew of six disappeared.

Libert has spent the last 30 years researching historical records and conducting exploratory dives in upper Lake Michigan. On one of his these dives last summer Libert and his group discovered an area with a large hand-hewn wood timber protruding from the bottom. It is thought to be the vessel's bowsprit and carbon dating tests done on a sample by Beta Analytic Laboratories in Miami and the University of Arizona are promising, but not conclusive.

To confirm the exact identity of the vessel requires locating more items from the site, but with much of the ship entombed in the lake bottom, some high tech equipment is needed. Key artifacts to find would be one or more of the seven cannons. To effectively search the football field size area, Libert has



acquired JW Fishers PT-1 pinpointing magnetometer. A powerful detector of ferrous metal, the PT-1 can easily locate individual ferrous artifacts even on a wreck site littered with many iron objects. To protect the scientific and historic value of this incredible find, a partnership has been established with the state of Michigan and the Republic of France. Work is continuing as weather permits.

For more information, visit www.jwfishers.com.

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A Worldwide Survey of Recent Ocean Observatory Activities: 2014 Update

Contributed by the Ocean Observing Systems Committee, MTS

This is the sixth annual update of worldwide ocean observatory activities reported by the Marine Technology Society's (MTS's) Ocean Observing Systems Committee. MTS would like to thank all of our loyal contributors for sending in updates and photos each year, as well as the new contributors to this year's update. These contributions help raise awareness of the importance of ocean observing systems around the world.

Europe

CYCOFOS & TWERC – Cyprus

In April 2014, the CSnet International Inc. Offshore Communications Backbone (OCB) was transitioned from a buoy-based power and communication (VSAT) system to a shore-based electro-optical power and communication system. The OCB Ocean Observing System is now connected to shore via the Poseidon submarine telecommunication system that is operated by Radius Oceanic Communications. Poseidon's dual conductor cable provides constant voltage and fiber bandwidth service to the OCB on a utility basis, while also providing constant current and fiber to future subsea communications customers. The OCB connects into the eastern and western legs of Poseidon, which in turn are connected to shore stations owned by the Cyprus Telecommunications Authority (Cyta), as depicted in Figure 1. The new architecture provides inherent improvements in power feed and data path redundancy (dual shore stations power, diverse data route and restoration paths), bandwidth with reduced latency, and reduced long-term operating/maintenance costs. Near-term plans are the design and integration of vertical profiling arrays off the eastern and western nodes of the OCB network.

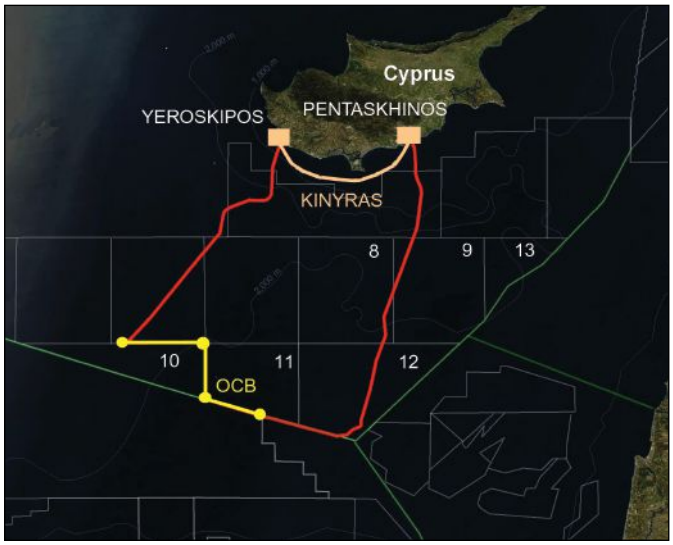


Figure 1. OCB (yellow) connected to Poseidon Communications Cable (red) (Courtesy of Radius Oceanic Communications)

LoVe – Norway

The Lofoten – Vesterålen Ocean Observatory (LoVe) is the result of long-term joint work by Statoil ASA and the Institute of Marine Research (IMR). It is located in an oceanographic, biologic and economic hotspot off the North Norway coast (Figure 2). It is an oceanographic hotspot because the shelf is very narrow and the northern drift of warm Atlantic water is concentrated and very dynamic in this area. The properties and amount of warm Atlantic water passing this area drive the development of the marine environment in the High North later in the year. It is a biological hotspot because the large oceanic fish stocks are passing through or spawn in the area and the first feeding of many larvae is taking place here. Finally, the area is expected to hold large oil and gas resources, but exploitation of these resources is controversial due its importance of this region for fish, fish predators and fishermen. The current condition can now be observed directly at http://love.statoil.com.

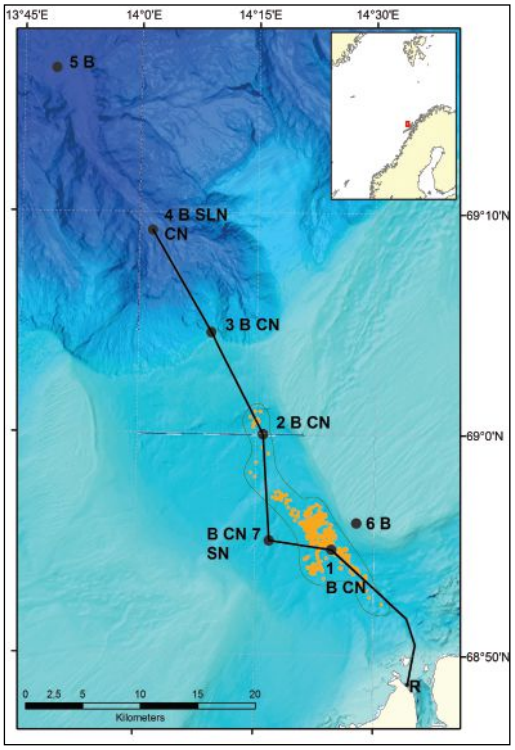


Figure 2. Node 1 of the Lofoten Vesterålen Ocean Observatory has been launched and is the first step in a planned transect to include five nodes (Courtesy of Terje Torkelsen, Metas AS)

LoVe is an initiative to further develop the knowledge base of the physical, chemical and biological environment as well as support the general monitoring of the key area. The observatory is located at 255 m depth in an area with deepwa-

ter corals. It holds a suite of sensors, including a camera for coral observations, CTD, acoustic current profiler, chlorophyll and turbidity sensors, and finally an echosounder with two transducers and a hydrophone. More sensors will be implemented at a later stage.

The first node, which now is positioned about 20 km off the Norwegian coast, is the first step in a planned observatory transect passing over the shelf and into deepwater. The potential of the LoVe as a provider of data for climate, fisheries and ecosystem research will not be released before this transect is established. In the meantime, a lot of interesting phenomena can be observed directly at the LoVe website, where the data can be downloaded and used by anybody.

The Americas

U.S. IOOS

When you think of a robot, the first picture that comes to mind may not be a swimming machine gliding around in the water beside you, perhaps diving under your hull, crisscrossing your path. How about a swarm of underwater robots? But that is exactly the vision of the NOAA-led U.S. Integrated Ocean Observing System (IOOS®).

Last fall, amid hurricane season, IOOS® partners deployed a fleet of 14 underwater robotic vehicles, also known as gliders, off the eastern seaboard of North America (Figure 3). Scientists from the Mid-Atlantic Regional Association Coastal Ocean Observing System (MARACOOS) initiated the effort that they dubbed "Gliderpalooza," inviting partners from other IOOS® regions and Canada. The team timed the majority of deployments with the peak of the Atlantic storm season. One part of the mission focused on collecting data to help improve understanding of hurricane intensity. But the overarching goal was to coordinate a variety of ocean research efforts, funded by disparate programs from several agencies, to demonstrate continental scale coordination of various ocean observing technologies to sample ecologically relevant scales.

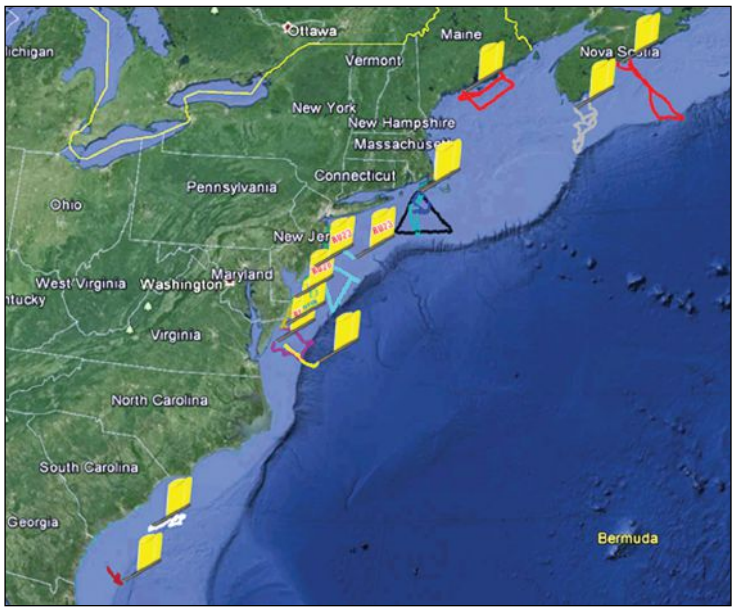
"When storms are moving along our coasts, lives depend on accurate forecasts," said Zdenka Willis, U.S. IOOS® program director. "The unmanned gliders allow us to collect data in the middle of the storm so that we can better understand hurricane intensity. We are working with NOAA's National Weather Service on how this information can improve forecast precision."

Scientists deployed the gliders in different locations spanning from Nova Scotia down to Georgia, over the course of about a month, keeping each glider deployed for 3 to 8 weeks. Gliders can travel thousands of miles and continuously collect and send back ocean data. They can operate for several months at a time and dive repeatedly to collect three-dimensional ocean observations. Rutgers University led these combined science missions, involving all three of the east coast IOOS® regions: Northeast, Mid-Atlantic and Southeast. Figure 4 shows the deployment of one of the gliders in Gliderpalooza.

While this past storm season did not produce any large storms to fully exercise this coordinated group of gliders, IOOS® partners plan to carry out a similar project again this coming hurricane season. The exercise met several other goals by having many gliders deployed simultaneously, resulting in coordinated data collection.

During the exercise, the gliders collected acoustic data on fish and mammal migrations (e.g., right whales, tiger sharks, Atlantic sturgeon and Atlantic salmon) to improve understanding of their behaviors. Canada's Ocean Tracking Network donated several acoustic fish/mammal tracking sensors to the project that were attached to nine gliders. Data from these gliders were combined with satellite data, buoys, and high-frequency radar systems in order to analyze species locations and provide a perspective of the northeast ecological domains.

Another key achievement the mission realized is that it provided a unique data set, including both real-time and hindcast data, that modelers can use for years to come. The database collected is enabling studies to improve data assimilative forecast models. The goal is to support improvement of the ensemble of ocean models.



Gliderpalooza Gliders- 2013

	Group	Glider	Funding	Dist (km)
1	Dalhousie	OTN200	OTN	707
2		OTN201	OTN	575
3		OTN201	OTN	240
4	UMaine	Penobscot	Maine	737
5	WHOI	Saul	ONR	362
6	UMass	Blue	IOOS	482
7	Rutgers	RU28	EPA	697
8		RU22	IOOS	331
9		RU23	IOOS	411
10		RU23	IOOS	443
11	UDelaware	Otis	Private	299
12	VIMS	Amelia	VIMS	455
13	NC State	Salacia	NASA	430
14	Skidaway	Modena	Skidaway/SECOORA	237
15	T. Webb	Darwin	Teledyne	351
16	Navy	Navy1	Navy	500
			TOTALS:	7257

Figure 3. Glider deployments during "Gliderpalooza" – a true grass-roots effort: 14 gliders, 2.5 months, 17 deployments (Courtesy of Mike Crowley, MARACOOS)

Figure 4. Glider Penobscot being launched to explore the Eastern Maine Coastal Current (Courtesy of Neal Pettigrew, Physical Oceanography Group, University of Maine)

Further, the mission provided a 3D snapshot of the Mid-Atlantic Bight cold pool. During summer, a distinctive bottom-trapped, cold water mass called the Cold Pool Water resides as a swath over the mid to outer continental shelf throughout much of the Middle Atlantic Bight. This evolving cold water pool is important because it strongly influences the ecosystem, including several important fisheries. Thus, there is a priority to better understand the relevant ocean processes and develop a cold water pool forecast capability.

An added bonus to the mission is that it demonstrated the potential of a national glider network. Partners from Federal agencies, the IOOS® regions, and universities are working on a plan for a viable, sustainable, and reliable glider network that delivers timely monitoring and distribution of coastal subsurface data to Federal, State, and local governments, as well as the general public. The plan is structured to develop an initial network that includes maintaining existing glider lines, acquiring additional glider lines to fill high priority gaps, and improving data management, product development, and data/product delivery.

This mission proved some of the potential for that vision, even successfully delivering real-time glider data in the formats needed for collection at the National Weather Service's National Data Buoy Center, which then made data available to the U.S. Navy and other data users. The U.S. Navy took part in the exercise by deploying a glider and is interested in sharing data in future exercises as well. And the mission accomplished all these things while simultaneously engaging undergraduates in ocean observing efforts along the way. Data from the glider missions is now public and available at the IOOS® Glider Data Assembly Center at http://tds.gliders.ioos.us/ and http://www.ndbc.noaa.gov/gliders.php.

In addition to NOAA funding provided through the IOOS® regions, other funding sources for the project include the Office of Naval Research, the Environmental Protection Agency, NASA, a private donor from the University of Delaware, and Canada's Ocean Tracking Network.

IOOS® is a Federal, regional and private sector partnership working to enhance the ability to collect, deliver and use ocean information. IOOS® delivers the data and information needed to increase understanding of our ocean and coasts so that decision makers can act to improve safety, enhance the economy, and protect the environment.

OOI CGSN & RSN

Construction of the 925-km regional cabled observatory (Regional Scale Nodes) component within the NSF Ocean Observatories Initiative (OOI) is scheduled to be completed by early October 2014 (Figure 5). Commissioning and full operations are scheduled for early 2015. Major progress was

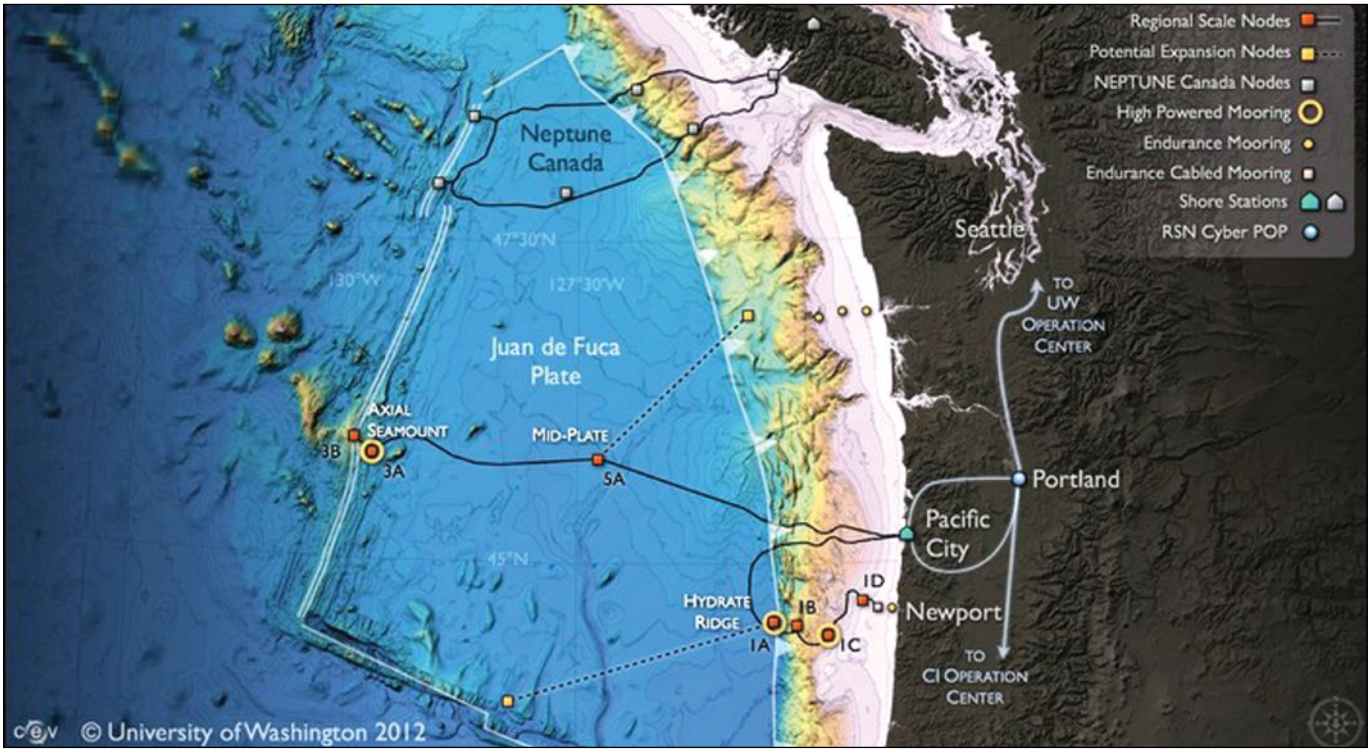


Figure 5. The 925-km cabled network of the NSF-funded Ocean Observatories Initiative Regional Scale Nodes is scheduled for commissioning in early 2015 (Courtesy of OOI RSN and CEV, University of Washington)

Figure 6. The OOI-RSN Deep-Water Profiler being installed on the mooring cable at the Friday Harbor Laboratories test site in November 2013 (Courtesy of Tim McGinnis, UW)

made in the installation of RSN secondary infrastructure in summer 2013 during the VISIONS '13 expedition on the R/V Thompson and using ROV ROPOS. Installed and tested were 22,000 m of fiber-optic extension cables, three medium-powered junction boxes, four short-period seismometers, and a high-definition video camera. (See http://www.interactiveoceans.washington.edu/story/Success_During_the_OOI_NSF_VISIONS13_Expedition for more details.) Work scheduled for the July to October 2014 VISIONS '14 expedition will include deployment of innovative, University of Washington-designed cabled moorings with deep-water profilers and shallow-water profilers and platforms. Figure 6 shows a deep-water profiler being installed at a test site.

AOOS

What is the effect of melting glaciers on ocean acidification? This summer, scientists in the Gulf of Alaska are getting a close up look at ocean acidification dynamics in Prince William Sound, an ecologically rich embayment in the Gulf of Alaska, and how these chemical processes might be affected by glacial outflow. Starting in May, two surface wave gliders, resembling yellow surfboards, began cruising around the Sound as part of a 5-month monitoring program to measure ocean acidification (Figure 7). Simultaneously, state-of-the-art instrumentation installed on a glacier tour boat is monitoring glacial runoff while an underwater autonomous glider patrols beneath the surface looking for plumes of water that could be harmful to some species.

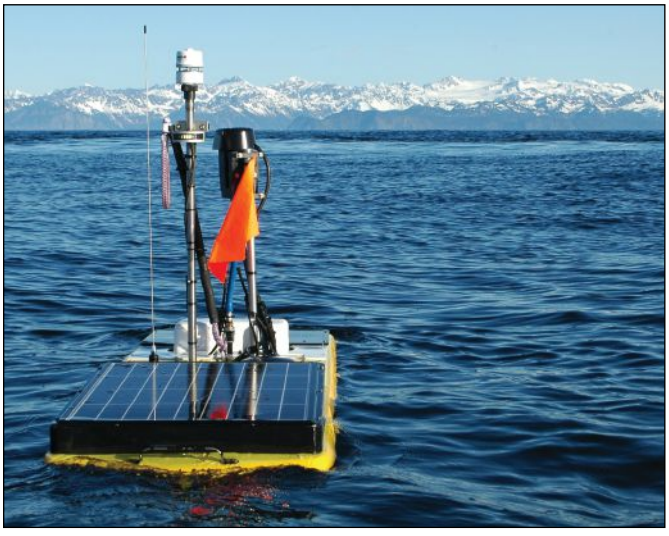


Figure 7. A NOAA-PMEL carbon wave glider makes its way across a transect near Montague Strait in the Gulf of Alaska, sending information on ocean chemistry to scientists via satellite telemetry (Courtesy of Wiley Evans)

The project, funded mostly by the National Oceanic and Atmospheric Administration's Ocean Acidification Program, is led by Dr. Jeremy Mathis of the Pacific Marine Environmental Laboratory and Dr. Wiley Evans from the University of Alaska Fairbanks (UAF) Ocean Acidification Research Center (www.sfos.uaf.edu/oarc) in partnership with the Alaska Ocean Observing System (AOOS) (www.aoos.org).

Scientists estimate that the ocean is 25% more acidic today than it was 300 years ago, largely due to increasing levels of atmospheric carbon dioxide (CO_2) from burning fossil fuels and changes in land use. Almost half of the CO_2 emitted remains in the atmosphere, with the land and ocean absorbing the rest. When the ocean absorbs CO_2, its pH balance changes through a process called ocean acidification. Because cold water can absorb more CO_2 than warm water, acidification can disproportionately impact coastal regions around Alaska.

Recent publications by Dr. Mathis and Dr. Evans have shown that the process of ocean acidification may be worsened around tidewater glaciers due to the freshwater melt plumes that occur in summer and fall. "The glacier melt plumes have some really unique chemistry that can exacerbate ocean acidification and impact the environment in Prince William Sound and out into the Gulf of Alaska," Mathis said. "Our goal is to use the latest technology to find out what's happening so we can communicate that to Alaska residents and stakeholders."

According to AOOS executive director Molly McCammon, the research effort builds upon the partnership developed with the OA Research Center at UAF to support statewide OA monitoring. The consortium supports five buoys around the State, as well as twice-a-year sampling in the Gulf of Alaska and development of a Gulf of Alaska OA forecast model. Data from the monitoring efforts will be available on both the AOOS website and the UAF's OA Research Center website. "With this new effort, we're increasing our ability to view and understand Alaska's oceans in four dimensions — two dimension space, depth and time."

When completed in early September, the study will have provided the longest continuous observations of ocean acidification in Alaska to date. "We are very proud to have the opportunity to partner with AOOS on this project," said Mathis. "This work could be a game-changer in our understanding of how ocean acidification will impact our state."

ONC's VENUS and NEPTUNE Canada

Throughout 2013, the University of Victoria's Ocean Networks Canada (ONC) continued to build upon the proven technologies of the NEPTUNE and VENUS cabled ocean observatories off the coast of southern British Columbia (BC). The observatories represent a $200 million infrastructure investment for Canada and are unique on the global stage because their fixed infrastructure makes data available, free and in real-time, from over 200 undersea instruments distributed across the most diverse ocean environments found anywhere on Earth. Over 850 km of powered fiber optic cable today service nine undersea sites, from the Salish Sea and Northeast Pacific to the remote Arctic Ocean.

ONC conducted five major maintenance expeditions as part of the 2013 operations plan, employing a variety of ves-

Figure 8. Paul Macoun and Coast Guard crew during the deployment of the Saanich Inlet instrument platform (Courtesy of ONC)

sel platforms and remotely operated vehicle (ROV) systems.

Beginning in early March, the year's first expedition headed for the VENUS coastal observatory sites in the Salish Sea, conducting seafloor platform maintenance with the ROV Oceanic Explorer on board the M/V Oceanic Surveyor.

In late April, ONC operations embarked on a series of back-to-back maintenance expeditions stretching to the end of June for service and research support at both the VENUS and NEPTUNE cabled observatories. To enable observatory maintenance on this cruise, we welcomed back the ROV Oceanic Explorer and team from CanPac Divers.

The first 10-day mission, on board the CCGS John P. Tully, focused on VENUS sites in Saanich Inlet (Figure 8) and the Strait of Georgia. The Delta Dynamics Laboratory, damaged by an underwater event in summer 2012, was completely re-installed at the mouth of the Fraser River. Other highlights included servicing of ongoing forensics experiments in Saanich Inlet, the deployment of hydrophone listening systems in the Strait of Georgia, and the installation of a dedicated bottom boundary layer experiment, led by researchers from Dalhousie University.

Over 19 days in May, operations shifted to NEPTUNE's offshore observatory in the Northeast Pacific, west of Vancouver Island. Highlights on this second leg with the Tully included servicing nearshore nodes Folger Passage and Barkley Canyon (<1,000 m), including six instrument platforms and almost 60 instruments — from video cameras and methane sensors to Wally the sea-bottom crawler. New instruments were added to measure oxygen, track vocalizing sea mammals, and delineate the growth of gas hydrate mounds. A comprehensive water properties sampling plan was implemented to study the spring-time dynamics of deep low-oxygen water.

At the end of May, an ONC team sailed with the IODP Expedition 341S on the JOIDES Resolution to support deployment of a unique new instrument in a former CORK observatory near NEPTUNE's Clayoquot Slope site. The Simple Cabled Instrument for Measuring Parameters In-situ (SCIMPI) was designed for studies in sub-seafloor hydrology, methane hydrate formation and seismic activity.

In June, summer maintenance shifted to NEPTUNE's three deep-sea sites in the Northeast Pacific, serviced by the R/V Thomas G. Thompson with the Millenium ROV from Oceaneering International. With 20 days at sea and no weather downtime, this expedition completed 19 dives at Endeavour, Cascadia Basin and Clayoquot Slope. Instruments deployed included Tempo-Mini, the Benthic and Resistivity Sensors (BARS) vent probe, and Remote Access Water Sampler (RAS). The expedition also hosted two educators with ONC's Ship2 shore program, which engages public audiences of all ages, via live satellite communications.

Rounding off the season, a very busy week-long maintenance expedition in October paired the CCGS Vector with the CanPac Divers' ROV Oceanic Explorer. Major objectives included recovery and servicing of all instrument platforms on the VENUS ocean observatory (Figure 9), as well as relocating the forensic platform with two new pig carcasses to the deeper Strait of Georgia seafloor site.

Progress continued throughout 2013 to complete the Phase II expansion of sensor systems on the VENUS observatory, with the first deployments of autonomous gliders and a number of specialized bottom packages for studying water and sediment dynamics. The new Buoy Profiling System was installed in central Saanich Inlet, and preparations continued for installing SeaKeeper shipboard instrumentation systems and weather stations on two additional BC ferry routes crossing the Salish Sea.

In the far north, the Cambridge Bay cabled mini-observatory, deployed in late summer 2012, was fully serviced in September 2013, completing its first year of continuous, live data from the Arctic.

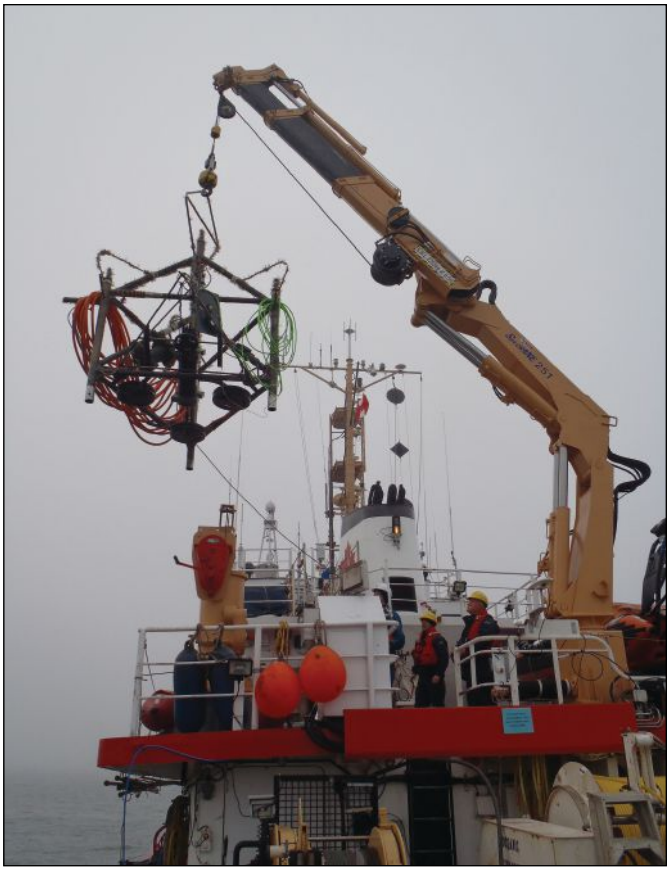


Figure 9. Deck operations of the test bed hydrophone array recovery (Courtesy of ONC)

A major collaboration with the Schmidt Ocean Institute in 2013 produced a month-long joint science support expedition divided into two legs. Spanning August and September, the SOI's Research Vessel Falkor navigated above the seafloor ocean observatory sites to study cross-margin pathways of low-oxygen water from offshore Pacific into the coastal Salish Sea and its impact on ecosystems.

Also launched this year, ONC began working with Marine Environmental Observations, Prediction, and Response (MEOPAR), managed out of Dalhousie University in Halifax, Nova Scotia. This program will develop a series of marine models and forecast systems to better respond to potential risks in Canada's diverse marine environments. Ocean Networks will provide both archived and live data from the VENUS observatory in the Strait of Georgia for model development and forecast assessment.

Building on its mandate to develop commercial opportunities created by the undersea networks, the ONC Innovation Centre continued a series of collaborations with Canadian industry to develop and improve observatory sensing technologies. An advanced anti-biofouling systems for water quality sensors developed by AML Oceanographics was tested at the Folger Passage Pinnacle site, using the M/V Alta and the Barkley Star with Pelagic Technologies' diving team. Broadband hydrophones from Oceans Sonics were also tested at sites across both the NEPTUNE and VENUS observatories.

The ONC ocean observatories have developed over the past 10 years with major funding from the Government of Canada, Canada Foundation for Innovation, Natural Sciences and Engineering Research Council of Canada (NSERC), the Government of British Columbia, and Canada's Advanced Research and Innovation Network (CANARIE).

OTN

The Ocean Tracking Network, a global oceans research and technology-development platform headquartered at Dalhousie University, is now in its fourth full year of operation and has just entered Phase II of NSERC funding and research.

OTN's global acoustic tracking receiver infrastructure is composed of over 1,000 units and contributes critical data to 164 projects on 52 species (e.g. Arctic char shown in Figure 10). OTN continues to work with leading Canadian and international researchers on pressing questions of global and regional relevance, such as migratory pathways of salmon, tuna and sharks, as well as identifying marine "hotspots" for consideration as Marine Protected Areas (MPAs) and monitoring the impact of offshore oil and gas infrastructure to vulnerable habitats. This information is relayed to policy makers via a strong social science contingent of OTN that's mandate includes casting a stronger framework for global oceans governance and stewardship.

OTN works with its marine industry partners to revolutionize the ocean observing landscape; the Liquid Robotics Wave Glider, the first of its kind in Canada, is an autonomous marine vehicle equipped to remotely track acoustically tagged marine animals and now has remote data offload capability. This greatly reduces the cost of ship-time needed for manual data retrieval as well as increasing safety to personnel.

Two OTN Slocum gliders were deployed in the Atlantic Ocean as part of Gliderpalooza, the first simultaneous launch of ocean-monitoring gliders en masse (12 institutions from Canada and the U.S., led by Rutgers University) to collect

Figure 10. Arctic char are monitored in a holding pen post-tagging (Courtesy of Jean-Sebastian Moore, OTN/U Victoria)

oceanographic and tracking data on the Scotian Shelf and Mid-Atlantic Bight during peak hurricane season. The event was a huge success and provided a unique, standardized data set as well as demonstrating the value of an international glider network (discussed further in the US IOOS section).

Global operations have expanded to include a new partnership with Universidade Federal do Rio Grande and Universidade do Vale do Itajai in Brazil, dubbed OTN-BR, which includes deployments in the region to monitor sharks, goliath groupers, and mullets, as well as deployments on the joint U.S.-France-Brazil PIRATA (Prediction and Research Moored Array in the Atlantic), a series of ocean monitoring buoys in the Southern Atlantic Ocean.

Asia

Indian Ocean Observing Systems: Moored Buoys

National Institute of Ocean Technology (NIOT) is engaged in the establishment and maintenance of a data buoy network (introduced in ON&T, June 2011) for measurement of metocean parameters in Indian Seas to monitor the marine environment and improve weather and ocean forecasts. Considering the importance of continuous, reliable, and high-quality data, ESSO-NIOT under the Ministry of Earth Sciences (MoES), Government of India, maintains 23 metocean and tsunami buoys (Figure 11). From April 2012 to March 2013, the Ocean Observing Systems (OOS) group completed 82 deployments/ retrievals for which 13 cruises comprising 196 ship-days covering 18,900 nmi with 2,400 man-days were undertaken. Strategic locations in the Bay of Bengal and Arabian Sea were identified as deployment sites based on the recommendations of experts, and the next generation buoy system called Ocean Moored buoy Network for Northern Indian Ocean (OMNI) was evolved.

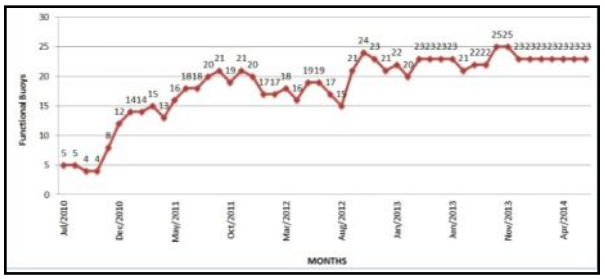


Figure 11. NOIT monthly buoy status showing the progression of functional buoys (Courtesy of NOIT)

Seven buoys deployed in the Northern Indian Ocean are part of the Tsunami Early Warning System project and are equipped with bottom pressure recorders. Five of these were developed and deployed by NIOT and two by SAIC (USA) with the support of NIOT. Indian Tsunami buoy data are available at the NDBC-NOAA website where it is made available to warning centers and the scientific community (http://www.ndbc.noaa.gov/).

Figure 12. Newgen Buoy being deployed in the Bay of Bengal (Courtesy of NOIT)

NOIT continues to improve their buoy designs and expand applications. Four coastal buoys deployed off Gujarat, Andaman, Agatti, and Goa are specially designed to withstand site-specific conditions while providing real-time oceanographic and meteorological data 24/7 to the mission control center of NOIT. Two of these buoys also support a coral reef monitoring program, where 3D underwater imaging is being conducted.

A new discus shape buoy, the Newgen buoy shown in Figure 12, designed for increased operational life and payload capacity (more than doubling the volume of the existing buoys), was recently deployed in the Bay of Bengal at 17.5N/89.5E. The buoy has redundant communications systems and is equipped with a pressure sensor, gas detection sensor and multiple temperature sensors. A moon pool is provided for instrument mountings, and two round "fenders" on the outer edge of the hull provide protection during deployment and retrieval.

Figure 13. Green Buoy prototype equipped with a wind turbine (Courtesy of NOIT)

With the abundant offshore wind energy potential, a pilot study was initiated to install a wind turbine on a buoy system to generate DC power from a permanent magnet DC generator coupled with an aerofoil type wind turbine. A prototype "Green Buoy" (Figure 13) with a 200-W wind turbine was deployed off Andaman for testing and further improvements are underway to make this system operational for field conditions.

To better understand the changes of the upper ocean, the Indigenous Buoy Data Acquisition System (IDAS) OMNI buoy has been developed to measure 106 parameters including atmospheric pressure, relative humidity, rainfall, wind speed, wind direction, solar radiations, precipitation, vertical current profiles, conductivity and temperature. The buoy system is composed of a 500-m induction cable that is used to continuously measure the conductivity and temperature at different depths.

NIOT has successfully deployed an autonomous ocean ambient noise measurement system in shallow waters off Visakhapatnam that has collected time series measurements during northeast monsoons including the Thane cyclone.

Drifter buoys are also being developed to collect and process sea surface temperature, atmospheric pressure and salinity. These data along with the GPS position are transmitted to a shore station using an INSAT-based communication system. Drifter Pradyu-I (Prototype-2) has been developed and deployed in the Bay of Bengal for testing. A process has been initiated to produce these systems in large numbers through Indian industry to support MoES observation programs.

An Autonomous Underwater Profiling Drifter (AUPD) has been developed to acquire temperature and conductivity at various depths in the uppermost 2,000 m water column. This development supports an Indian Argo program that is part of a global array of 3,000 free-drifting floats providing real-time data for climate and ocean science. The first system produced by Indian industry based on NIOT technology was deployed off Lakshadweep Islands in the southeastern Arabian Sea using NIOT's ship on 14 May 2013. This system has completed more than 100 profiles so far, demonstrating good performance.

Under ocean technological developmental activity, newer initiatives such as underwater cameras for coral reef monitoring in Andaman, AQUABOT autonomous ocean observation equipment and Laboratory Scale Glider are also being pursued.

NIOT will establish a Calibration facility for all metocean and oceanographic sensors in the near future. Groundwork for this new facility has been completed, and construction and procurement of equipment is underway. OOS is also working with the Indian Institute of Tropical Meteorology (IITM), Pune, on coastal observation for CO2 studies, and with National Centre for Antarctic and Ocean Research (NCAOR) on moored observations in Southern Ocean and Arctic region. Furthermore, India is planning to deploy IndARC observation system in the Arctic region during July 2014.

Oceania

ALOHA Cabled Observatory

Since June 2011 and for over 3 years now, the ALOHA Cabled Observatory (ACO) (www.aloha.manoa.hawaii.edu) is providing 1 kW power, 100 Mb/s network communications and precise and accurate timing to a seafloor node and instruments at 4,728 m water depth 100 km north of Oahu. Station ALOHA

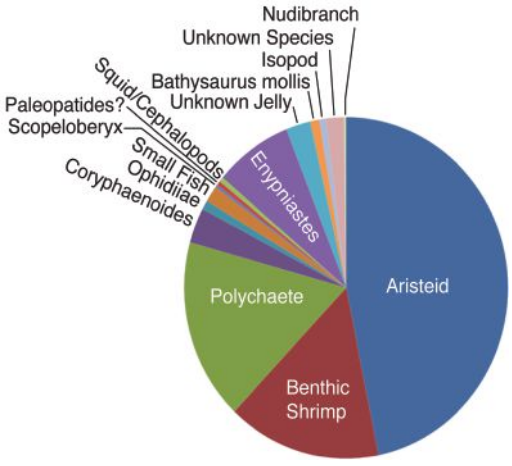


Figure 14. The most exciting 20 seconds or so was when a deep-sea lizard fish attacked an aristeid shrimp (Courtesy of J. Drazen and A. Fleury, UHawaii)

is the field site of the Hawaii Ocean Time-series (HOT) program that has investigated physical and biogeochemical variability of the water column near monthly since 1988.

In this oligotrophic environment, the video camera detected significant biological activity. Over 6 weeks, 15 species were identified as well as a number of unidentified ones (Figure 14). Acoustic data are being analyzed to determine detection and classification algorithms for baleen and other whales. The temperature time series clearly shows multiple abyssal cold overflow events, each including rapid sloshing/wave fluctuations on the order of days. These results highlight the need for continuous, unaliased sampling.

The first annual maintenance cruise is now scheduled for late October 2014. A new basic sensor package (with CTDO2, fluorometer, pressure, ADCP, acoustic modem) and a video camera (with lights and hydrophone) will be deployed. The ACO welcomes new science projects. Over the next years, we anticipate users with profiling mooring systems reaching the surface, bottom cameras and carbon flux sensors, distributed basic sensor nodes, and more. ACO is supported by the U.S. National Science Foundation.

Figure 15. WaiQTahi on display at a Cawthron open day prior to its deployment (Courtesy of Cawthron Institute)

HAWQiTahi – New Zealand

The Cawthron Institute is about to install an ocean monitoring buoy in the Firth of Thames (southern Hauraki Gulf) on New Zealand's North Island (Figure 15). The water quality buoy, called WaiQTahi (Wai = Māori for water, Q = quality, Tahi = Māori for one), is owned and managed by the Waikato Regional Council.

WaiQTahi builds on earlier collaborations between Cawthron, the Monterey Bay Aquarium Research Institute (MBARI), and Hawkes' Bay Regional Council in developing the HAWQi and TASCAM systems (ON&T, Sept 2013) and will follow the same data exchange protocols and standards and open sharing ethos of the previous systems. As such, it will make a major contribution toward the growing network of coastal ocean observation platforms in New Zealand.

The new system includes a variety of instruments that measure weather, currents, temperature, salinity, turbidity, chlorophyll, and dissolved oxygen. Cawthron continues to develop smaller-scale platforms (nicknamed micro-water quality or mWQ buoys) that are most recently being deployed for real-time monitoring in estuaries and coastal waters surrounding Auckland.

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

Hawboldt Industries wins auspicious contract
Hawboldt Industries Ltd. is pleased to announce that it has been chosen by Seaspan's Vancouver Shipyards to supply the deck machinery for the new Offshore Fisheries and Science Vessels (OFSV) as part of the National Shipbuilding Procurement Strategy (NSPS) for non-combat vessels. The contract is for the first of three planned vessels in the OFSV program now underway in North Vancouver, British Columbia. The OFSV are the first vessels to be built under the $8 billion NSPS program for Non-Combat vessels, awarded to Seaspan in 2011. The OFSV will replace aging vessels operated by the Canadian Coast Guard in the Pacific, Maritime and Newfoundland and Labrador Regions of Canada. These vessels are used for fisheries assessments and scientific ocean research. Hawboldt Industries will be responsible for the design and manufacture of the entire scope of deck equipment for the fisheries and science missions, including deck cranes, all fishing winches and controls, the science winches along with specialized launch and recovery systems. "This is a significant order for Hawboldt and demonstrates the confidence and trust shown by Seaspan's Vancouver Shipyards in our ability to meet the schedule and technical requirements for these modern vessels," says John Huxtable, general manager of Hawboldt Industries. "This is another step to establish Hawboldt as a total solutions provider in the global market for research vessel deck machinery." Equipment is expected to be delivered in early 2015.

DSME and ABS collaborate on first LNG-fueled drillship
ABS, the leading provider of classification services to the global offshore industry, has entered into a joint development project (JDP) with South Korea's Daewoo Shipbuilding & Marine Engineering (DSME) to develop the industry's first LNG-fueled drillship. The JDP will address challenges associated with storing and managing cryogenic LNG safely by combining DSME's experience developing and applying LNG technology to floating structures with ABS' technical standards and experience working on a number of gas-fueled, LNG and regasification unit projects. "This project builds on years of collaboration between ABS and DSME to evaluate innovative design concepts and new approaches that serve the needs of our clients and feature enhanced safety and efficiency standards," says Dr. Hoseong Lee, ABS vice president, global Korea business development and ABS Korea Energy Technology Center in Busan. "We are targeting the Gulf of Mexico as a key market for an LNG fueled drillship where, given the abundance of affordable shale gas resources in the U.S., LNG as a marine fuel makes good economic sense." To initiate the project, DSME has performed a concept design, comparison between two types of LNG storage tanks and analysis of the fuel gas supply system that will be installed on the drillship. ABS' scope of work calls for concept design review, basic engineering review and a risk assessment of the tank space and access area, fuel gas supply system, machinery space and access area and associated configurations. The verification aspect of the JDP will rely on ABS' extensive experience as the preferred classification society for the offshore and energy industry for more than 60 years and its experience leveraging these capabilities to help industry move LNG-as-fuel and other gas developments forward.

OEG Offshore boosts international reach with Caspian-focused acquisition
Leading cargo-carrying unit and A60 engineering cabin specialist OEG Offshore announced the acquisition of OSCA Environmental Services Limited, significantly expanding its international reach in the Caspian region. OEG has acquired OSCA's entire 2,500-unit stock, bases in Baku, Azerbaijan and Aktau, Kazakhstan, Turkmenistan as well as stocking locations in Sakhalin, Russia, Gabon, Congo and Angola and full staff of 35 people boosting its global team to more than 165. It is OEG's second major global growth move in less than 2 months, following the establishment of a joint venture with Unique Maritime Group to provide offshore equipment for rental and sale in the Middle East, which was announced in May.

First of new Fugro Offshore Coastal Survey Vessel delivered to Fugro N.V.

Fugro has taken delivery of the first of three Fugro Offshore Coastal Survey Vessels (FOCSV) being built by Damen. The first of a new class, the Fugro Proteus is a compact survey ship capable of undertaking a wide range of survey, monitoring and inspection operations.

The vessel is designed for a variety of survey and inspections duties including light geotechnical work, environmental baseline surveys, monitoring and inspection, and moon pool deployments. Diesel electric propulsion delivers excellent economy at all speeds.

Fugro Proteus is the first of three survey vessels ordered by Fugro for delivery in 2014. Each will be operating in a different part of the world and so they have been adapted for the individual environments in which they will work. The operating company is a specialist in the acquisition of the full spectrum of survey data and so the vessels have been tailored to be adaptable for a wide range of tasks.

Fugro Proteus is the first vessel to be built directly by Damen for Fugro. However, the two groups have worked together on a number of refits in recent years, and in the process have built a relationship based on trust and mutual understanding.

For more information, visit www.damen.com.

Kongsberg Norcontrol IT to revolutionize ship traffic management

Kongsberg Norcontrol IT will lead a ground-breaking 3-year project called SESAME Straits (Secure, Efficient and Safe maritime traffic Management in the Straits of Malacca and Singapore), which aims to create solutions to significantly improve the safety and efficiency of ship navigation across the world. An important test-bed for IMO's e-Navigation implementation strategy, the objective of the SESAME Straits Project is to develop and validate a revolutionary concept for a next generation Ship Traffic Management System (STMS) in the Straits of Malacca and Singapore (SOMS).

Partly funded by the Research Council of Norway, through its Marine and Offshore (MAROFF) fund, the NOK 23 Million SESAME Straits project is the first project to be delivered under the international Straits e-navigation Alliance. The Kongsberg Norcontrol IT-owned project will receive input and guidance from the Straits e-navigation Alliance High Level Advisory Board (HLAB) who met in

London on 16 May 2014. The HLAB includes governmental members from Singapore, Norway, Malaysia and Indonesia and experts from important maritime organizations such as IMO, IHO, IALA, ICS, BIMCO, CIRM, IEC, and the Research Council of Norway. The HLAB is co-chaired by Norway and Singapore.

The intelligent STMS for SESAME Straits will be based on shared situation awareness and cooperative decision making between the ship's bridge team and shore personnel. Bringing these elements together through e-Navigation for ship and shore side will achieve the key objectives of just-in-time arrival and minimizing vessel traffic hot spots. This will result in benefits including reduced ship bunkers, efficient traffic flow through narrow and restricted waterways, reduced navigation risk, reduced fuel consumption, reduced CO_2 emissions and better utilization of port resources such as anchorages, berths and pilots.

For more information, visit www.kongsberg.com/en/kds/kncit.

DNV GL helps Marine Transfer Forum improve incident reporting

Transferring personnel to offshore installations using crew boats and crane-lifted carriers is a common operation around the world; however, practices, levels of training, standards and the equipment used vary greatly.

Risk assessments currently use outdated statistics, and there is no central system for recording levels of activity and incidents. In order to improve safety performance and raise the profile of this operation, DNV GL, the global provider of risk management services, has carried out a study for the newly launched Marine Transfer Forum.

The Forum brings together offshore operators, vessel operators, lifting specialists, and transfer system manufacturers to increase industry knowledge and mitigate risk. Founder members include Reflex Marine, Enermech, Seacore Marine and DNV GL.

By creating this forum, operators will for the first time have a system to provide (anonymous) data on personnel transfer activity that will be used develop good quality risk data made available to the industry.

To start this, DNV GL has analyzed available data on global marine transfer accidents collated by Reflex Marine. This estimated that 5.15 million passengers were transferred from vessel to installation by crane in 2012. From 2009 to 2013, there were five fatal accidents, meaning the average rate is approximately one fatal accident per year worldwide, or a one in five million chance of fatality in each transfer. This compares to one in 400,000 chance of fatality if transferred by helicopter, 11 times higher than crane transfer. It should be noted that the crane transfer data excludes risks in transit, whereas helicopter data covers the complete journey to/from shore.

These results will be used to improve risk assessments of marine transfer. The Marine Transfer Forum will encourage systematic and regular data collection and aims to compile more comprehensive statistics in the same way as the offshore industry does for helicopter operations.

"Each year, the offshore industry makes about 5 million personnel transfers from crew boats," said Philip Strong, CEO of Reflex Marine. "This is not far short of the nine million annual

transfers by helicopter, but marine transfer attracts little attention compared to the well organized and resourced offshore helicopter industry."

"Risk assessments commonly rely on estimates of marine transfer risk that we published 20 years ago," said John Spouge, principal consultant with DNV GL. "We are very pleased to work with the industry to make the risk estimates more accurate and help manage the risks more effectively."

A paper entitled Risks of "Marine Transfer of Personnel Offshore" can be obtained by contacting DNV GL.

For more information, visit www.marinetransferforum.org.

PortVision CEO testifies at U.S. Congressional hearing on how to improve maritime safety, security and efficiency

PortVision®, a leading provider of business intelligence solutions for the maritime industry announced that CEO Dean Rosenberg has testified before the House Subcommittee on Coast Guard and Maritime Transportation. Rosenberg was one of six panelists who spoke 21 May 2014 on the subject of how new ocean technologies can promote efficient maritime transportation and improve maritime domain awareness and response capability.

Rosenberg testified about vessel-tracking technology advances and successes and the benefits of applying the latest commercial solutions and best practices to Federal agency initiatives. His testimony drew on PortVision's experience serving 3,000 users including marine service providers, vessel operators, third-party terminal operators and every major oil company.

Rosenberg's testimony was at the invitation of U.S. Representative Duncan Hunter, subcommittee chairman. With jurisdiction over the U.S. Coast Guard and issues ranging from port security and waterway safety to maritime transportation and regulatory activities, the subcommittee makes legislative recommendations to the House Committee on Transportation and Infrastructure. PortVision has been serving the maritime industry since 2006 with patented vessel-tracking services that leverage federally mandated Automatic Identification System (AIS) collision-avoidance data. PortVision customers use this service and its combination of both real-time and historical vessel-position data to solve business problems and improve a variety of maritime operations.

The Coast Guard and other federal agencies must rely on ocean observation and MDA technologies to make the most efficient use of valuable vessel, aircraft and crew time. To address this challenge, the congressional subcommittee focused its hearing on new ocean technologies, how these technologies can improve government performance, and any impediments that exist in the use of these technologies.

Rosenberg had two additional goals as part of his testimony: 1) raise awareness for the importance of ensuring that carriers continue to transmit a persistent AIS signal with accurate data, and 2) encourage federal agencies to look to the commercial sector and small business to help execute their maritime domain

awareness initiatives using AIS data and analytics technology.

During his testimony, Rosenberg offered the observation that current government systems appear to be good at collecting and displaying real-time data, but not aggregating and making it broadly accessible to field personnel who must clearly understand waterway utilization in order to carry out their mission objectives. This includes providing MDA support to mobile users who are not in centralized command centers with sophisticated COP-oriented systems. Rosenberg said that many of PortVision's non-government field users benefit from commercial tools like PortVision to support their mission, while frequently, Coast Guard, Army Corps, and other government field personnel do not have access to these tools.

Rosenberg also described the many additional uses for commercial AIS tools by companies as well as government organizations. He also said that AIS continues to grow in value. For instance, AIS is now helping the maritime industry accommodate today's surge of Gulf traffic, including vessels transporting crude oil shipments from new finds in the Dakotas, West Texas, Mexico, and other locations. Another promising development is the use of AIS in pipeline, bridge, and offshore asset protection. PortVision has partnered with CAMO – an industry trade association of Coastal and Marine Operators -- on a system to proactively notify vessels and pipeline operators when there is imminent risk that a vessel might damage pipeline infrastructure. Over the last two decades there has been over $100 million in property damage and over 25 fatalities associated with coastal and marine pipeline incidents. The CAMO project has received Coast Guard approval, and FCC approval is pending.

For more information, visit www.portvision.com.

exactEarth and Genscape announce strategic alliance

exactEarth Ltd., a leading provider of global maritime vessel data, is pleased to announce a new, expanded strategic alliance with Genscape Inc., the leading real-time energy information supplier to commercial markets. exactEarth and Genscape, having extremely complementary backgrounds and capabilities, are now looking to apply their respective technologies, resources, and experiences to jointly explore the development and distribution of AIS-based data products and services to customers around the globe.

"We are excited to enter into this agreement with Genscape," said Peter Mabson, president of exactEarth. "This is a great step forward as we will now be able to offer the rich maritime information databases of Genscape to our valued customers. Through this expanded relationship, we will continue to service hundreds of customers together across the globe and look forward to delivering enhanced premium maritime services to our joint markets."

Genscape, through its Vesseltracker GmbH affiliate, currently provides the most extensive terrestrial AIS information available as well as expansive ship information databases that will now also be available throughout the exactEarth product offering, enhancing the value of its exactAIS data service to maritime authorities around the world. In turn, exactEarth will be providing its industry leading Satellite AIS data services to Genscape for the creation of a wide array of derivative products including summary flow reports and critical analysis assessments. Under this agreement, Genscape and exactEarth are looking to expand their product offerings into the existing customer base while also working to expand into associated global markets.

For more information, visit www.exactearth.com.

Better ROV Operations with Autonomy and Advanced Control

By: Ben Kinnaman, President/CEO Greensea Systems, Inc.

Autonomy and advanced control capabilities are rapidly expanding the effectiveness and efficiency of Remotely Operated Vehicle (ROV) operations. Enabled by new, accurate, lower-cost navigation methods and high-resolution sensors, modern ROV control systems give a lot of power to operators and allow customers to reap significant rewards in cost savings and data quality. With a single click, ROV pilots can now perform automated inspections, transit programmed routes, and stay on station with centimeter accuracy for hours and days on end. These capabilities are ushering in the next era of underwater robotics and empowering the next generation of operators. Several technology developers, including Greensea Systems Inc., are proving ROV systems with these capabilities are viable, affordable, easy to learn, and ready for offshore.

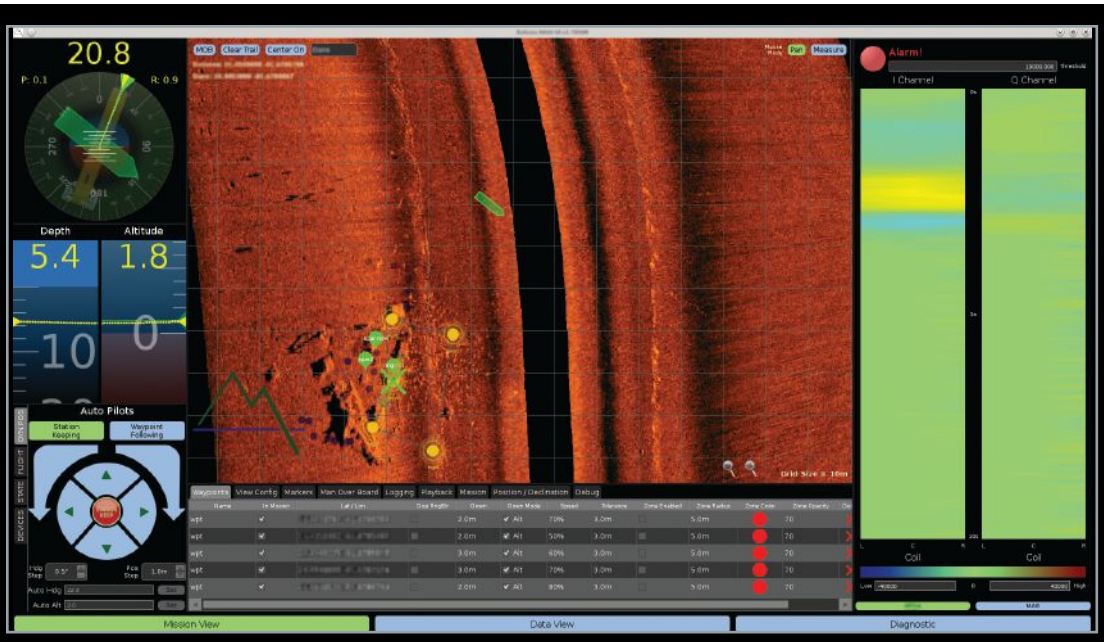
As the cost of offshore operations continuously rise and operational requirements continuously grow more stringent, ROV service providers are turning towards new technology. Work class ROVs have employed basic autopilots, station keeping, and dynamic positioning for years. Now, new technologies in ROV autonomy and advanced control are offering automated functions for riser inspections, route survey, pipeline survey, visual surveying, and feature-based sonar navigation.

Perhaps no class of vehicle benefits from autonomy and advanced control more than inspection class ROVs though. Outselling their larger work class brothers almost 10 to 1 over the past few years, inspection class systems are becoming tools of choice for many commercial offshore operations as well as for activities such as port and harbor security, dam inspection, Explosive Ordinance Disposal (EOD), Unexploded Ordnance (UXO) cleanup, science, and exploration. These small portable systems are being used by trained ROV service providers as well as first responders, Navy teams, security personnel, and inshore construction contractors. Further, empowered by the miniaturization of key components such as HD cameras, multibeam sonars, navigation sensors, and even manipulators, this class of vehicle is proving to be not only a viable alternative to work class ROVs for some activities, but preferred due to the associated costs savings.

An excellent example of ROV autonomy and advanced control functionality enabling ROV operations is illustrated by a recent project completed by Cobalt Marine LLC (Cobalt) and White River Technologies Inc (WRT). Cobalt and WRT jointly conducted open-water field trials on a new electromagnetic induction (EMI) system for UXO detection. EMI sensors for UXO operations have had a checkered history when deployed on ROVs. These systems require operation at a constant height off bottom, within centimeters, a constant attitude with respect to the bottom, and a constant transit velocity for accurate surveys. Wide-area EMI surveys to locate small anomalies require very dense coverage, usually less than 1-m line spacing. Conducting this type of survey with an ROV using a traditional man-in-the-loop control system is challenging and inefficient.

To support their UXO open water exercise recently, Cobalt used the Balefire ROV control system from Greensea Systems. Cobalt installed Balefire on their ROV to provide autonomy, mission planning, and advanced control. Additionally, Greensea provided a custom device driver for Balefire that interfaced WRT's EMI system to Balefire's operator workspace. This integration was completed in less 2 two weeks and ready in time to support the offshore trials in June.

The data sets collected from the trials show a tremendous improvement in data quality compared to past ROV deployments. Further, the wide-area surveys and target interrogations were conducted with an efficiency previously unknown in this type of work with ROVs. "The precise automation and vehicle control features provided by Greensea's technology allow for



Balefire ROV workspace with EMI sensor integration and survey data.

consistent and extremely accurate surveys. Navigating the vehicle and making precise movements to relocating targets is as easy as two mouse clicks. The intuitive survey planning tools make it very efficient to layout survey lines, waypoints and markers before going to sea," reported Gary Randolph, CEO of Cobalt Marine, after the exercises in June.

ROVs are more frequently being used in port and harbor security applications for missions including shiphull survey, pier and structure inspection, and diver detection. Due to minimal visibility, this is a complex and challenging environment in which to operate an ROV. Conventional navigation systems, including acoustic tracking, struggle to work effectively due to obstructions and high noise environments.

With ROV systems used as inspection tools in ports and harbors, security forces deploy them in both routine missions and in emergency situations. Maintaining proficiency requires that security, defense, patrol, and port personnel train regularly. Even with regular training and in the hands of the most experienced operators, ports and harbors present extremely challenging environments in which to operate ROVs effectively.

Greensea recently participated in port and harbor security exercises to explore the effectiveness of ROV autonomy and advanced control in that environment. For the exercises, Greensea retrofitted an available ROV with the Balefire control system. Additionally, Greensea installed their forward-looking sonar application, Endal, to interface the Tritech Gemini 720i multibeam sonar into the control system. Endal provides target tracking and feature-based navigation and control functions to the core Balefire system in addition to display, recording, and broadcast functions.

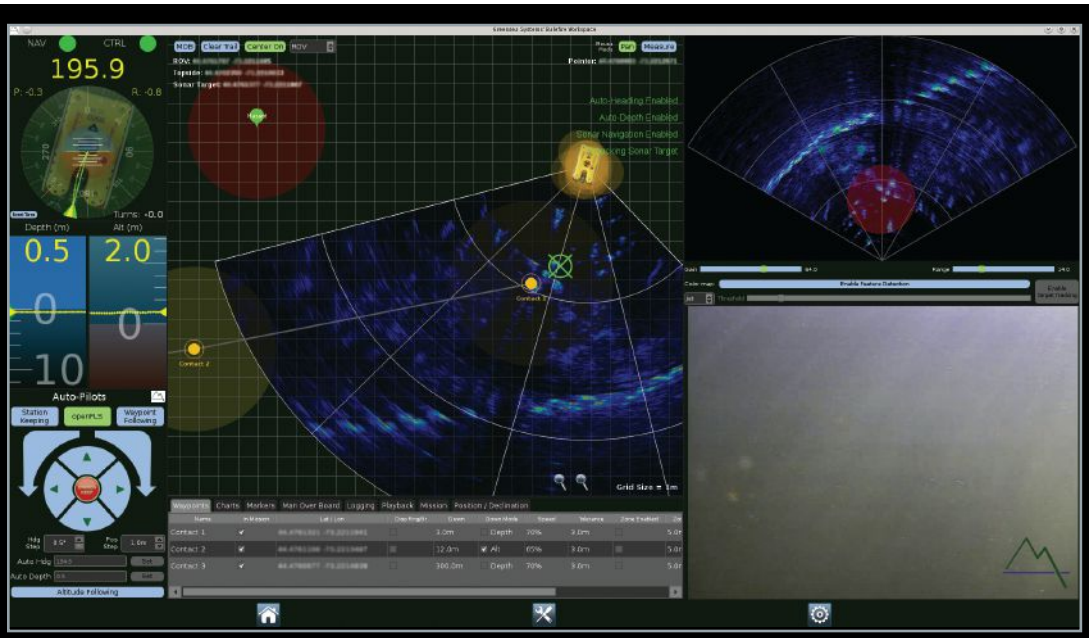
During several days of operations, ROV personnel took turns investigating port infrastructure, ship and boat hulls, and objects of interest detected during previous harbor surveys. Additionally, operators demonstrated extended loitering and observation tasks that require the ROV to remain in a single location, mid-water, for almost 6 hrs. Throughout these exercises, the test personnel utilized autonomous functions to execute route surveys, wall inspections, and target identifications.

With minimal training, operators confidently demonstrated effective ROV inspections using the automation and advanced control features enabled by Balefire. In lieu of using a DVL or USBL in this exercise, the system used only the navigation and localization solution provided by the Endal application. As the harbor provided a highly structured environment, feature-based navigation and target-relative control performed very well. Further, ROV pilots reported it was simple and intuitive to orient and position the vehicle using Balefire's integrated workspace.

In more and more applications, ROV crews are finding autonomy and advanced vehicle control provide them the tools they need to deliver customers greater capabilities and allow them to perform their jobs more efficiently. Autonomy modes allow personnel to pre-plan dives and execute jobs proficiently and consistently, regardless of the individual pilot. Advanced control functions such as autopilots, dynamic positioning, and sonar or vision-based target-relative control provide vehicle stability and ROV performance not possible with traditional operating modes. As these functions are primarily software-driven, the effectiveness and intuitiveness of the operator interface is critical to the success of this technology. The most effective implementations of this technology will employ a comprehensive workspace for the pilots that fuse sensor data, vehicle data, navigation, and control into a single, easy-to-use environment.

During a multibeam survey in early 2014, SeaView Systems upgraded their Saab Seaeye Falcon DR with Greensea's Balefire control system and operator workspace. "Mission planning and operations were a breeze. Not only does Greensea's Falcon control system enhance the efficiency of the project, it enhances the efficiency of the ROV by reducing the wear of the thrusters. Integrating the control system will reduce project costs and vehicle maintenance," said operations manager Geoff Cook after their first project utilizing their upgraded system.

With more stringent positioning requirements being specified in offshore service agreements, greater vehicle stability required by newer high-resolution sensors, and the continued rising costs of offshore operations, ROV autonomy and advanced vehicle control offer a powerful and viable solution. Speaking in the context of his recent experience with ROV autonomy in their UXO exercises, White River Technologies' chief technologist, Greg Schultz, echoed what many are finding with this new technology. "Advanced ROV control functions and autonomy allow for precise sensor placement and survey quality unattainable by human operators. The integration of these platforms, highly accurate navigation and control systems, and high-resolution geophysical sensors can overcome limitations of current diver-deployed, towed, and unmanned integrated underwater survey systems."



The Balefire workspace during port and harbor security exercises utilizing sonar feature-based navigation and control.

CSA Ocean Sciences Inc. becomes Esri business partner
CSA Ocean Sciences Inc. (CSA) is pleased to announce that through its GeoSpatial Services (GSS) business line it has recently become an Environmental Systems Research Institute, Inc. (Esri) Business Partner, joining a network of some of the most innovative and successful companies employing Esri geospatial technology and services worldwide. Esri develops and markets its proprietary geographic information system (GIS) software, data, web, and professional services solutions, and the Esri Partner Network was created as a global network of companies employing strategies to deliver cutting-edge geospatial solutions utilizing Esri technology as the foundation of their services. As a member, CSA will be able to leverage Esri's technological and marketplace resources to develop and expand its own business offerings derived from the Esri software platform. Keith VanGraafeiland, CSA's GSS Business Line Manager, explains, "This partnership is monumental for CSA. It provides a great opportunity as we move forward in crafting our own vision for providing superior quality solutions that capitalize on the support offered by a distinguished corporation such as Esri." This partnership is a testament to CSA's consistent pursuit of advanced geospatial work and dedication to high-quality science that is the backbone of the firm's success. As an Esri Business Partner, CSA is accredited by a worldwide leader in geospatial technology and is recognized for its technical expertise, unique GIS services and solutions, and commitment to implementing Esri technology for the success of its clients and end users.

The National Aquarium announces creation of sustainable seafood program
The National Aquarium announced the establishment of the National Aquarium Sustainable Seafood Program with a gift from the Dana DiCarlo and Scott Plank Family Foundation and their urban development company, War Horse. As part of the sustainable seafood program, the Aquarium will develop enhanced education programs to help people better understand their seafood options. It will also work to expand those choices through partnerships that link local fishermen to local markets, improve opportunities for restaurants to serve local seafood and explore enhancement opportunities associated with sustainable local aquaculture. The National Aquarium connects with more than 1.3 million guests per year in support of its mission to inspire conservation of the world's aquatic treasures. In addition, Aquarium supporters are able to participate in conservation activities, work with policymakers and be a part of a community that is engaged in building awareness of issues affecting ocean health, including the importance of sustainable seafood sources. The Aquarium is now accepting resumes for the National Aquarium's Director of Sustainable Seafood, who will develop, implement and lead the program, at www.aqua.org/jobs.

NSU's Oceanographic Center students start crowdsourcing campaign to help expand coral nursery initiative
For nearly five decades, Nova Southeastern University's Oceanographic Center has been a leader in marine research and education. The center focuses on several aspects of marine life – from coral reefs to invertebrates to sharks to deep-sea life – all with the common goal of understanding the nature of the marine realm and learning from the ocean's living classroom. NSU's Oceanographic Center is home to several research arms: the Center of Excellence in Coral Reef Ecosystems Research, the Guy Harvey Research Institute, the Save Our Seas Shark Centre, the Broward County, Florida Sea Turtle Conservation Program and the National Coral Reef Institute. All of these are involved in tremendous work in helping explore, understand and preserve the world's marine environments. To help with the costs associated with coral reef restoration, and to expand the program, the students themselves have started an online crowdsourcing campaign. The goal is to reach $10,000. The idea is to reach out to as many interested people as possible who are concerned with the ocean's coral reefs and want to help preserve them, but didn't know where to turn. The crowdsourcing website, which is spearheaded and fully operated by students involved in the program, can be found online at www.nova.edu/ocean/saveourcorals.

NOAA, FWS establish critical habitat for Loggerhead sea turtles in Northwest Atlantic and Gulf of Mexico

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) and the Department of Interior's U.S. Fish and Wildlife Service (USFWS) announced two final rules to designate critical habitat for the threatened loggerhead sea turtle in the Atlantic Ocean and on coastal beach habitat along the Atlantic and Gulf coasts.

The NOAA-designated marine critical habitat includes some nearshore reproductive areas directly off of nesting beaches from North Carolina through Mississippi, winter habitat in North Carolina, breeding habitat in Florida, constricted migratory corridors in North Carolina and Florida, and Sargassum habitat, which is home to the majority of juvenile turtles, in the western Gulf of Mexico and in U.S. waters within the Gulf Stream in the Atlantic Ocean.

The USFWS-designated terrestrial critical habitat areas include 88 nesting beaches in coastal counties in North Carolina, South Carolina, Georgia, Florida, Alabama and Mississippi. These beaches account for 48% of an estimated 1,531 mi of coastal beach shoreline used by loggerheads and about 84% of the documented numbers of nests within these six states.

"Protecting endangered and threatened species, including loggerhead sea turtles, is at the core of NOAA's mission," said Eileen Sobeck, assistant NOAA administrator for fisheries. "Given the vital role loggerhead sea turtles play in maintaining the health of our oceans, rebuilding their populations is key as we work to ensure healthy and resilient oceans for generations to come."

The Endangered Species Act (ESA) requires that NOAA Fisheries and USFWS, the two federal agencies responsible for administering the act, designate critical habitat when a species is listed, or within 1 year if critical habitat is not determinable at that time. Although loggerhead sea turtles were originally listed in 1978 worldwide, the listing was revised in 2011, when nine distinct population segments (DPS) were listed, including the Northwest Atlantic Ocean DPS and the North Pacific Ocean DPS, the only two that occur in areas under U.S. jurisdiction.

For more information, visit www.nmfs.noaa.gov.

Satellite-based study of water quality of Chilko Lake

ASL Environmental Sciences Inc. has successfully completed the LakeView Project, which was funded by the Canadian Space Agency (CSA) Earth Observation Application Development Program (EOADP) between 2011 and 2014. Lakeview's objective was to apply advanced remote sensing technologies to improve our understanding of factors that control freshwater survival of Sockeye salmon.

The project team led by ASL also included scientists from Fisheries and Oceans Canada, University of Victoria, and C-CORE. Historical archived environmental and satellite data were used in conjunction with in situ data to understand the present and historical water quality of Chilko Lake. Chilko Lake sockeye constitute one of the largest salmon stocks in the Pacific Northwest, for which Fisheries and Oceans Canada (DFO) has maintained a 55-year record, including partitioned freshwater and marine survival. The lake was also the site of fertilization experiments in the 1970s to 1990s. ASL examined the use of spaceborne data from MERIS and LANDSAT satellites collected over Chilko Lake for the purpose of generating a long time series of lake chlorophyll and water temperature, including testing and validating standard chlorophyll algorithms against in situ measurements. ASL also assessed the state of glaciers in the watershed using LANDSAT and RADARSAT data and performed comparisons of Sockeye survival with lake variables.

The end product of LakeView is a valuable collection of new spatial data products useful for a wide range of scientists and managers. The project also demonstrated the use of historical satellite time series data for limnology and salmon biology. The methods and data products developed during the project will continue to support ongoing research.

For more information, visit www.aslenv.com.

Tropical fish invasion destroys kelp forests

The migration of tropical fish as a result of ocean warming poses a serious threat to the temperate areas they invade because they overgraze on kelp forests and seagrass meadows, a new study concludes.

The harmful impact of tropical fish is most evident in southern Japanese waters and the eastern Mediterranean, where there have been dramatic declines in kelps.

There is also emerging evidence in Australia and the U.S. that the spread of tropical fish towards the poles is causing damage in the areas they enter.

"The tropicalization of temperate marine areas is a new phenomenon of global significance that has arisen because of climate change," says study lead author, Dr. Adriana Verges, of the UNSW School of Biological, Earth and Environmental Sciences.

"Increases in the number of plant-eating tropical fish can profoundly alter ecosystems and lead to barren reefs, affecting the biodiversity of these regions, with significant economic and management impacts."

As the oceans have warmed and the climate has changed, hotspots are developing in regions where the currents that transport warm tropical waters towards the poles are strengthening.

Increased flow of the East Australian Current, for example, has meant waters southeast of the continent are warming at two to three times the global average. Tropical fish are now common in Sydney Harbour during the summer months.

Japan, the east coast of the U.S., northern Brazil and southeastern Africa are also strongly influenced by coastal currents that transport warm tropical waters.

"In tropical regions, a wide diversity of plant-eating fish perform the vital role of keeping reefs free of large seaweeds, allowing corals to flourish. But when they intrude into temperate waters they pose a significant threat to these habitats. They can directly overgraze algal forests as well as prevent the recovery of algae that have been damaged for other reasons," says Dr. Verges, who is also a member of the Sydney Institute of Marine Science.

For more information, visit www.unsw.edu.au.

NOC welcomes new UK strategy reaffirming key role of robotic and autonomous systems

A new UK Robotic and Autonomous Systems (RAS) Strategy was published last week and launched at an event attended by the Science Minister, Rt Hon David Willetts MP. This was the result of nearly 2 years of work by a Special Interest Group (SIG) set up by the Technology Strategy Board (TSB), which the National Oceanography Centre (NOC) participated in. Earlier, the Minister announced a new wave of

government investment in British innovation, which sees £400 million pounds earmarked for key sectors including the marine industry and an ongoing commitment to robotics.

For nearly two decades, NOC has been at the forefront of developing and deploying such systems in hazardous marine environments in depths of up to 6,500 m as well as under Antarctic ice shelves. Now numbering about 40 vehicles, the fleet is the largest in Europe and includes an ROV capable of transmitting live HD imagery from the seabed as well as a wide array of unmanned surface vessels and submarines.

One of the projects highlighted at the strategy launch was a small business research initiative (SBRI) to develop a new breed of unmanned surface vehicles (USV). These would be capable of gathering data from the oceans for several months and would be powered primarily by energy harvested from the environment. The project was initiated by NOC and jointly funded by its parent body, the Natural Environment Research Council (NERC) and the TSB.

The RAS 2020 Strategy presents a vision for innovation in one of the Government's "Eight Great Technologies" and aims to bring together innovators, researchers and potential end-users to build on UK successes in these areas. Its key priorities include developing and operating new tools for working in harsh environments and ensuring that technological innovations are demonstrated in real-world environments.

For more information, visit www.noc.ac.uk.

Safeguarding Belize's barrier reef with conservation drones

Seeking to gain a high-tech edge over illegal fishers, the Government of Belize will use "eyes in the sky" to enforce fishing regulations in the biodiverse Glover's Reef Marine Reserve and other reef systems in what is the first use of conservation drones to monitor marine protected areas.

With technical assistance from the Wildlife Conservation Society, the Belize Fisheries Department initiated a new monitoring program using unmanned aerial vehicles (i.e. conservation drones) to curtail unsustainable levels of illegal fishing. Besides coastal development, unregulated and unreported fishing are some of the largest threats to Belize's fishing industry.

Conservation drones also are being used for wildlife monitoring and for support in the enforcement of terrestrial protected areas. The unmanned aerial vehicles can fly autonomously for over an hour at a time with a range of more than 50 km, and are capable of taking high-resolution photographs and video.

Program participants from WCS, the Belize Fisheries Department, and Conservation Drones.org fully implemented the drone program in early June, following testing that began last July. The drones will enable government officials to remotely locate fishing vessels illegally operating in marine protected areas or in areas with seasonal closures. Once located, patrol vessels can conduct seagoing searches more efficiently.

For more information, visit www.wcs.org.

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Study provides new approach to forecast hurricane intensity

New research from the University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science suggests that physical conditions at the air-sea interface, where the ocean and atmosphere meet, is a key component to improve forecast models. The study offers a new method to aid in storm intensity prediction of hurricanes.

"The general assumption has been that the large density difference between the ocean and atmosphere makes that interface too stable to effect storm intensity," said Brian Haus, UM Rosenstiel School professor of ocean sciences and co-author of the study. "In this study we show that a type of instability may help explain rapid intensification of some tropical storms."

Experiments conducted at the UM Rosenstiel School Air-Sea Interaction Salt Water Tank (ASIST) simulated the wind speed and ocean surface conditions of a tropical storm. The researchers used a technique called "shadow imaging," where a guided laser is sent through the two fluids – air and water–to measure the physical properties of the ocean's surface during extreme winds, equivalent to a Category 3 hurricane.

Using the data obtained from the laboratory experiments conducted with the support of the Gulf of Mexico Research Initiative (GOMRI) through the CARTHE Consortium, the researchers then developed numerical simulations to show that changes in the physical stress at the ocean surface at hurricane force wind speeds may explain the rapid intensification of some tropical storms. The research team's experimental simulations show that the type of instability, known as Kelvin-Helmoltz instability, could explain this intensification.

Haus and colleagues will conduct further studies on hurricane intensity prediction in the new, one-of-a- kind Alfred C. Glassell, Jr., SUSTAIN research facility located at the UM Rosenstiel School. The SUrge-STructure-Atmosphere INteraction laboratory is the only facility capable of creating Category 5 level hurricanes in a controlled, seawater laboratory. The nearly 65-ft long tank allows scientists to simulate major hurricanes using a 3-D wave field to expand research on the physics of hurricanes and the associated impacts of severe wind-driven and wave-induced storm surges on coastal structures.

The SUSTAIN research facility is the centerpiece of the new $45 million Marine Technology and Life Sciences Seawater Complex at the UM Rosenstiel School where scientists from around the world have access to state-of-the-art seawater laboratories to conduct an array of marine-related research.

The study, titled "The air-sea interface and surface stress under tropical cyclones," was published in the June 16 issue of the journal Nature Scientific Reports. The paper's lead author was Alex Soloviev of the UM Rosenstiel School and Nova Southeastern University Oceanographic Center, and its coauthors include Mark A. Donelan from the UM Rosenstiel School; Roger Lukas of the University of Hawaii; and Isaac Ginis from the University of Rhode Island.

For more information, visit www.rsmas.miami.edu.

Nature's strongest glue comes unstuck

Over a 150 years since it was first described by Darwin, scientists are finally uncovering the secrets behind the super strength of barnacle glue.

Still far better than anything we have been able to develop synthetically, barnacle glue – or cement – sticks to any surface, under any conditions.

But exactly how this superglue of superglues works has remained a mystery – until now.

An international team of scientists led by Newcastle University, UK, and funded by the U.S. Office of Naval Research, have shown for the first time that barnacle larvae release an oily droplet to clear the water from surfaces before sticking down using a phosphoprotein adhesive.

Publishing their findings in the prestigious academic journal Nature Communications, author Dr. Nick Aldred says the findings could pave the way for the development of novel synthetic bioadhesives for use in medical implants and micro-electronics. The research will also be important in the production of new anti-fouling coatings for ships.

"We've known for a while there are two components to the bioadhesive but until now, it was thought they behaved a bit like some of the synthetic glues - mixing before hardening. But that still left the question, how does the glue contact the surface in the first place if it is already covered with water? This is one of the key hurdles to developing glues for underwater applications," says Dr. Aldred, a research associate in the School of Marine Science and Technology at Newcastle University

"Advances in imaging techniques, such as 2-photon microscopy, have allowed us to observe the adhesion process and characterize the two components. We now know that these two substances play very different roles – one clearing water from the surface and the other cementing the barnacle down. It's an incredibly clever natural solution to this problem of how to deal with a water barrier on a surface it will change the way we think about developing bio-inspired adhesives that are safe and already optimized to work in conditions similar to those in the human body, as well as marine paints that stop barnacles from sticking. The key here is the technology. With these new tools we are able to study processes in living tissues as they happen. We can get compositional and molecular information by other methods, but they don't explain the mechanism. There's no substitute for seeing things with your own eyes. " explains Dr. Aldred.

"In the past, the strong lasers used for optically sectioning biological samples have typically killed the samples, but now technology allows us to study life processes exactly as they would happen in nature."

The research will also be of interest to the shipping industry. Biofouling costs the global industry an estimated $7.5 billion a year in wasted fuel.

Other implications include the movement of invasive species around the world and increased emission of greenhouse gases.

For more information, visit www.ncl.ac.uk.

Gibraltar signs first PPA for renewable energy
The government of Gibraltar has signed its first power purchase agreement for the provision of renewable energy. The agreement with Eco Wave Power is for the provision of an initial 0.5 MW energy device on the eastside, with a view to further expansion up to a full 5 MW plant if the project is successful. Eco Wave Power is an international wave power developer, headquartered in Israel. Their technologies use uniquely shaped buoys to capture and convert wave energy into low-cost, clean electricity and the floaters will be specifically designed in accordance with our particular wave climate. The system will also have in-built storm protection and shock-wave protection mechanisms. Wave energy is being deployed more and more widely across the globe and Gibraltar's unique location, coupled with the ability to reliably calculate and project wave patterns, mean that this is a very promising technology for the Rock. This agreement forms part of H.M. Government of Gibraltar's overall plan for increasing the level of renewable energies in Gibraltar, with a view to moving away from our current dependence on fossil fuels towards a more sustainable energy future.

Memorandum of Understanding signed between Minesto and Florida Atlantic University
Swedish marine energy technology company Minesto, developer of innovative tidal and ocean current power plant Deep Green, has signed a Memorandum of Understanding (MoU) with Florida Atlantic University. The purpose is to examine the technical, environmental and economic feasibility to install demonstration and commercial power plants in the Florida current. Florida Atlantic University (FAU) is home to the Southeast National Marine Renewable Energy Center (SNMREC), a federally designated U.S. research and testing center with the mission to help accelerate the commercial realization of marine renewable energy recovery, with a preliminary focus on the Gulf Stream. By executing this MoU, Minesto and FAU aim to develop a partnership with cooperative mutual research, testing, and educational activities. Minesto's tidal and ocean current power plant called Deep Green looks like an underwater kite and is based on a fundamentally new principle for electricity generation from tidal and ocean currents. Deep Green recently became the first known marine power plant to generate electricity from low velocity currents, which is seen as a breakthrough for marine energy.

Green light for Dudgeon offshore wind farm
Statoil and Statkraft have decided to start building the Dudgeon Offshore Wind Farm off the coast of Norfolk, UK. The project aims for full production in late 2017. When completed, Dudgeon will provide renewable energy for 410,000 households in the UK. The Dudgeon development will now move into a new phase, starting with construction of onshore cables and an onshore substation. Offshore construction work will start in 2016. The total investment in Dudgeon is estimated to be £1.5 billion.The Dudgeon owners are preparing for a partnership structure reflecting this investment level. Combining Statoil's offshore competence with Statkraft's experience from large renewable energy projects will generate value for owners, suppliers and UK industry as a whole. The Dudgeon investment could provide benefits for the UK's offshore wind industry. At least 70 local jobs will be created directly in the operations phase and additional jobs during construction and indirectly in the supply chain. Statoil is the operator of the Dudgeon Offshore Wind Project and will lead the project towards production, followed by operations and first electricity to grid during the first half of 2017. Dudgeon Offshore Wind Farm will be constructed with 67 wind turbines, each with a capacity of 6 MW, totaling 402 MW installed generation capacity. The annual energy production is estimated to be 1.7 TWh. This is enough energy to power up to 410,000 UK homes. The North Sea project site is located 32 km offshore, north of the town of Cromer in North Norfolk, and 20 km northeast of the Sheringham Shoal Offshore Wind Farm.

A&P Falmouth completes first device to be deployed at Wave Hub

A&P Falmouth has completed its second major renewables project, after leading wave energy firm Seatricity's next generation Oceanus 2 device left the docks for Wave Hub.

The wave energy converting device–a 10 m diameter floating ring made from marine grade aluminum – will be the first device to be deployed for testing at Wave Hub, the offshore renewable energy test facility 10 mi off the coast of Hayle.

The larger rated capacity Oceanus 2 was built in the fabrication workshops, assembled on the quayside and deployed from a wharf at A&P's shipyard in Falmouth. If testing is successful, it will pave the way for the manufacture of a further 60 devices.

Seatricity plans to develop a full-scale, 10 MW grid-connected array over the next 2 years at Wave Hub, just a short distance from the Falmouth shipyard.

In the simplest terms the device travels up and down with the waves and operates a pump to pressurize sea water to drive a hydroelectric turbine to produce electricity.

The float is tethered to blocks on the seabed and the pumps are linked together to generate substantial amounts of highly pressurized water. This pressurized sea water can also be used for directly producing fresh water by the reverse osmosis desalination process. Both fresh water and electricity can be produced simultaneously.

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

Nova Innovation, ELSA secure funding for Shetland tidal array

Following the successful deployment of the world's first community-owned tidal turbine in Shetland, Nova Innovation (Scotland) and ELSA (Belgium) have secured funding to build the Shetland Tidal Array–potentially the world's first in-sea tidal array.

The £3.75 million investment package supported by Scottish Enterprise will deliver this pioneering project and accelerate the growth of new projects across Europe. The partnership draws together pan-European partners and brings significant inward investment to Scotland.

The array project will see further development of the existing Bluemull Sound site in Shetland with the deploy-

ment of a further five 100kW devices. The array will be developed in two phases with commissioning of the first three devices by the end of 2015.

ELSA is a Green Energy company based in Tournai (Belgium) and is part of the IDETA Group. ELSA has a strong track record in energy projects with interests in biomass, solar, wind, hydro-power and demand side infrastructure. It is expanding its energy mix and portfolio to include the development of tidal power projects in the UK to complement its investments across Europe.

Nova Innovation Ltd is a Scottish-based tidal technology company, delivering tidal power for communities, businesses and utilities. Building on years of research and development in the marine renewables sector, the team has developed a technology that enables clients to unlock the value of tidal resources at commercially competitive rates. Nova Innovation offers full water to wire tidal solutions for clients.

ELSA and Nova Innovation have formed Shetland Green Electricity Ltd to develop the Shetland Tidal Array. The 0.5 MW array will consist of five 100 kW devices and will be deployed in the Bluemull Sound in 2015/16. The array forms the engineering extension of the existing Nova 30 project which was successfully deployed at the same site early in 2014. In addition, the partners will begin work on potential tidal projects across Europe.

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

Seafloor carpet catches waves to generate energy

UC Berkeley engineers are developing a seafloor carpet system for harnessing ocean energy. Assistant professor Reza Alam got the idea of creating a seafloor carpet from real-world muddy seabeds, which are known to dampen the energy of surface waves. While surfers would not find this appealing, boaters and fishermen regularly use such safe harbors to escape from destructive wave surges during strong storms. Alam noted that his seafloor carpet system would not be considered for use in popular surf zones.

To simulate the effects of a muddy seabed, the engineers used a thin sheet of rubber that sits on top of a grid of hydraulic actuators, cylinders and tubes. As the rubber carpet moves up and down with the waves, it pumps the cylinders, creating hydraulic pressure that is piped onshore to be converted into power.

The researchers noted that while rubber was used in the lab experiments, they would look to longer-lasting elastic composite materials when deploying a system in the ocean.

Early experiments with wave tanks at UC Berkeley have been promising. In results presented most recently at the 10th European Wave and Tidal Energy Conference in Denmark, the researchers showed that the wave carpet was able to absorb more than 90% of incoming wave energy.

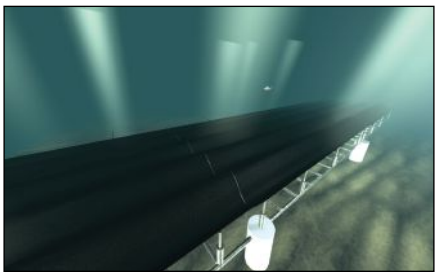
Alam estimated that 1 sq. m of a seafloor carpet system could generate enough electricity to power two U.S. households. He added that wave energy from just 10 m of California coastline, or about 100 sq. m of a seafloor carpet, could generate the same amount of power as an array of solar panels the size of a soccer field, which covers about 6,400 sq. m.

Ideally, the system would be located in shallow coastal waters about 60 ft deep. The topography of the seafloor need not be flat, but areas with reefs would be avoided. Alam emphasized that, in the search for appropriate sites, they would look for areas that would not negatively impact marine life.

The researchers are considering whether the ever-growing number of nearshore "dead zones"–low-oxygen regions in the ocean with little marine life–would be strong candidates for pilot testing their system.

Funding for this research was provided by the American Bureau of Shipping. The researchers also set up a project site via Microryza, a crowd-sourcing platform for research projects.

For more information, visit www.berkeley.edu.



Largest offshore wind energy area available for commercial development

Secretary of the Interior Sally Jewell and Bureau of Ocean Energy Management (BOEM) Acting Director Walter Cruickshank joined Massachusetts Governor Deval Patrick to announce more than 742,000 acres offshore Massachusetts will be available for commercial wind energy leasing. The proposed area is the largest in federal waters and will nearly double the federal offshore acreage available for commercial-scale wind energy projects.

The Massachusetts Wind Energy Area is located approximately 12 mi offshore Massachusetts–from its northern boundary, the area extends 33 nmi southward and has an east/west extent of approximately 47 nmi. BOEM proposes to auction the Wind Energy Area as four leases.

The announcement builds on Interior's work to stand up a sustainable offshore wind program through its "Smart from the Start" wind energy initiative for the Atlantic Coast. To date, BOEM has awarded five commercial wind energy leases off the Atlantic coast: two non-competitive leases (Cape Wind in Nantucket Sound off Massachusetts and an area off Delaware) and three competitive leases (two offshore Massachusetts-Rhode Island and another offshore Virginia). To date, competitive lease sales have generated about $5.4 million in high bids for about 277,550 acres in federal waters. BOEM is expected to hold additional competitive auctions for Wind Energy Areas offshore Maryland and New Jersey later this year.

For more information, visit www.boem.gov.

TenneT appointed as offshore grid operator in the Netherlands

Electricity transmission operator TenneT welcomed the Dutch government's decision to appoint TenneT as the operator of the offshore power grid in the Netherlands.

A power grid at sea is necessary to connect offshore wind energy sources to the national transmission grid. The Dutch government has explained its decision on this matter in a letter to the Lower House of the Dutch Parliament.

TenneT will construct grid connections for offshore wind farms with a total capacity of 3,450 MW. The wind farms will be erected in the Dutch part of the North Sea in the period until 2023, further to the Energy Agreement brokered by the Social and Economic Council of the Netherlands (SER). The electricity produced by these wind farms will be sufficient to meet the annual electricity needs of approx. 1 million households (nearly one-seventh of the total number of households in the Netherlands).

For more information, visit www.tennet.eu.

Milestone cleared first West Coast wave energy lease

The Bureau of Ocean Energy Management (BOEM) has taken an important step toward issuing a research lease for a facility to test utility-scale wave energy devices in federal waters off Oregon. The non-competitive lease would be for the offshore area where the Northwest National Marine Renewable Energy Center at Oregon State University (Center) would site the hydrokinetic energy research project.

The Center proposes to design, build and operate the Pacific Marine Energy Center – South Energy Test Site about 4 nmi offshore Newport, where water depths range from 180-230 ft. The project is designed to support up to 20 MW of electricity generation which would be transmitted to the mainland grid via a subsea cable.

The announcement builds on BOEM's activities to grow offshore renewable energy through issuing leases for renewable energy initiatives. BOEM has awarded five commercial wind energy leases off the Atlantic coast (two non-competitive leases and three competitive leases) and has scheduled another competitive lease sale for a Wind Energy Area off Massachusetts later this year. BOEM expects to hold additional competitive auctions for wind energy areas offshore Maryland and New Jersey in the next year.

The Center is one of three national research groups supported by the Department of Energy to facilitate the development of marine renewable energy technology with research, education and outreach.

BOEM has exclusive jurisdiction to issue leases, easements, and rights-of-way regarding Outer Continental Shelf lands for hydrokinetic projects. The Federal Energy Regulatory Commission (FERC) has exclusive jurisdiction to issue licenses and exemptions for the construction and operation of hydrokinetic projects on the Outer Continental Shelf.

For more information, visit www.boem.gov.

SOUND OCEAN SYSTEMS, INC.

Sound Ocean Systems, Inc. (SOSI), a woman-owned small business located in Redmond, Washington, was formed by Ted Brockett in 1978 and specializes in winches, launch and recovery systems, data buoys, and towed bodies. Ted's wife, Stephanie, joined the company full-time in 1988 as the Secretary/Treasurer. In 2008, their son Don, signed on as a Mechanical Engineer and was recently elected as Vice President. The company has 12 employees and is supported by several contract engineers, an outside fabrication shop, and several local machine shops. SOSI's lean structure has allowed the company to provide marine products to commercial, academic, and government customers around the world at competitive prices for more than 35 years and is ideally suited to rapidly respond to customer needs. SOSI's focus is to provide products designed specifically to meet customer requirements.

Winches

SOSI manufactures standard and custom winches ranging from small ≤10-HP electric instrumentation winches developed for CTDs and other small instruments to large 200-HP hydraulic umbilical winches used for ROVs and seafloor drills. SOSI's medium winches include autonomous surface vessel winches, tow winches, aerostat winches, and underwater winches. Recent winch projects include three mechanical sweep winches for a foreign navy and electric winches for Oregon State University (125-HP Heavy Lift) and the University of Washington (75-HP Medium Lift).

Launch and Recovery Systems (LRSs)

SOSI is a leading manufacturer of ramp-style Launch and Recovery Systems (LRSs) that are typically used for towed bodies and AUVs. They have been used in over 3,000 launch and recovery operations in open ocean environments including Sea State 5. These high sea state capable systems have allowed customers to operate in expanded weather windows, increasing survey efficiency. SOSI recently delivered its largest LRS to date, a system designed for a 10-m long, 10,000-lb AUV, and three fully autonomous deploy and retrieve (D&R) systems for use aboard foreign mine sweeping vessels. The D&Rs rotate from on deck, 190° outboard to a position below horizontal where the towfish can be released below the waterline. These D&Rs incorporate high temperature tolerant towing fairleads, and docking cones with fail-safe latches and motion-based self-adjusting damping brakes. SOSI conducted a full complement of MIL-STD tests on the first article D&R and mechanical sweep winch prior to delivery.

Oceanographic Data Buoys

SOSI has a family of ocean observation buoys for protected water, coastal and open ocean environments. SOSI data buoys are typically provided with meteorological and oceanographic sensors and a choice of telemetry options including RF, cell phone, Wi-Fi, and satellite-based systems. Buoys are provided with data logger/controllers programmed for the desired sampling and data transmission schedules. Buoy hulls are constructed of closed cell polyethylene foam encapsulated in thick polyurea skin. The hulls are extremely tough, UV resistant and virtually unsinkable. SOSI's Bay Monitor buoy is a small, robust, easily deployed, shallow water data buoy that delivers the highest quality data set and dramatically lowers operating and support costs. When service is required, technicians can service the buoy, including electronic enclosures and sensors, from a small boat without lifting capability. A small winch allows access to all subsurface sensors.

Towed Bodies

SOSI continues to develop towed bodies for seafloor mapping, imaging, water sampling and environmental monitoring. From galvanized open-frame steel designs to neutrally buoyant, faired, fiberglass designs, SOSI towed bodies are custom designed for the application. SOSI's neutrally buoyant towed bodies are an excellent platform for systems requiring high stability. Recent deliveries have included towed bodies used for environmental monitoring and surveys for hydrothermal vents.

Offshore installation vessel Aeolus is operational

Van Oord marked the entry into service of Aeolus, its first transport and installation vessel for the construction of offshore wind farms.

The vessel was built at Sietas, a German shipbuilding yard in Hamburg. The innovative and advanced transport and installation vessel has a length of 139 m, 38 m in the beam, a design draught of 5.7 m and a cruising speed of 12 kts. The vessel is equipped with a crane that can lift more than 900 tons and has accommodation facilities for 75 crew. The installation vessel can be jacked up and can work in a water depth of up to 55 m.

The vessel's first project will be the construction of the Luchterduinen offshore wind project, which is an Eneco energy company and Mitsubishi Corporation assignment. This project will be built 23 km off the Dutch coast near Noordwijk and Zandvoort. The wind farm will consist of 43 Vestas V112 wind turbines. In 2015, the wind farm will provide 129 MW in green energy to almost 150,000 households. Luchterduinen will be operational after the summer of 2015. As EPC contractor, Van Oord is responsible for the engineering, procurement and construction of the foundations, the complete electrical infrastructure, including the offshore transformer station and the installation of the wind turbines. The vessel is already completely occupied for 2014, 2015 and 2016. After Luchterduinen, the vessel will be deployed on the Gemini project, where 150 wind turbines are being installed 55 km off the coast of Schiermonnikoog in depths of 35 m.

For more information, visit www.vanoord.com.

OMM, Geofabrics launch new sustainable scour protection solution

Offshore Marine Management (OMM) has teamed up with Geofabrics Australasia, which provides geotextiles and geosynthetic engineering solutions to create a new and effective, environmentally sensitive and sustainable solution for scour protection at the base of wind turbines.

OMM will be using Geofabrics' ELCOROCK System, a robust sand filled container made from the highest durability geotextile fabric, to provide an alternative to rock placement protection, which also helps marine life to thrive and could assist in securing planning permission.

ELCOROCK was originally developed over 20 years ago to prevent erosion of beaches along the Australian Gold Coast shoreline and has also proven to be beneficial to the environment, encouraging underwater habitats to grow around the system. OMM will be working closely with Geofabrics to repurpose the product for use in the renewables industry by utilizing its knowledge and providing advice on the correct design, detailing and planning installations of this system along with an ongoing maintenance plan.

For more information, visit www.offshoremm.com.

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Recently Discovered Italian WWII Battleship ROMA Mapped with AUV & ROV

By: Garry Kozak, GK Consulting

Introduction

It was September 3, 1943, and the Italian Armistice was agreed upon, ending Italian support of Germany during WWII.

The Roma (Image 1), under the command of Captain Adone del Cima, was leading a fleet of three battleships, three cruisers, and eight destroyers. The fleet left La Spezia on September 9 in an attempt to convince the Germans that they were going to attack Allied ships. The real intent was to divert to Malta and surrender to the allied forces. The deception did not work. Lookouts spotted aircraft shadowing the fleet. The hope was that the aircraft were from the Allied forces, but to their disappointment they were German Dornier Do 217 airplanes with the intent to bomb the fleet.

Bombs were dropped from an abnormally high altitude and, as became painfully clear, these were not standard free fall bombs. These bombs were being steered towards the Roma by remote control. The Roma was hit by two bombs, with one, detonating the forward magazine. A massive explosion resulted that blew the turret skyward. The type of bomb that was used to sink the Roma was the first in a new class of weapons known today as precision-guided munitions. The bomb was a massive 3,450-lb, radio-controlled glide bomb that the Germans called the Fritz-X. This was the first time this kind of high-tech weapon had ever been used. The Roma was sunk off Sardinia with only 596 survivors and the tragic loss of 1,352 men.

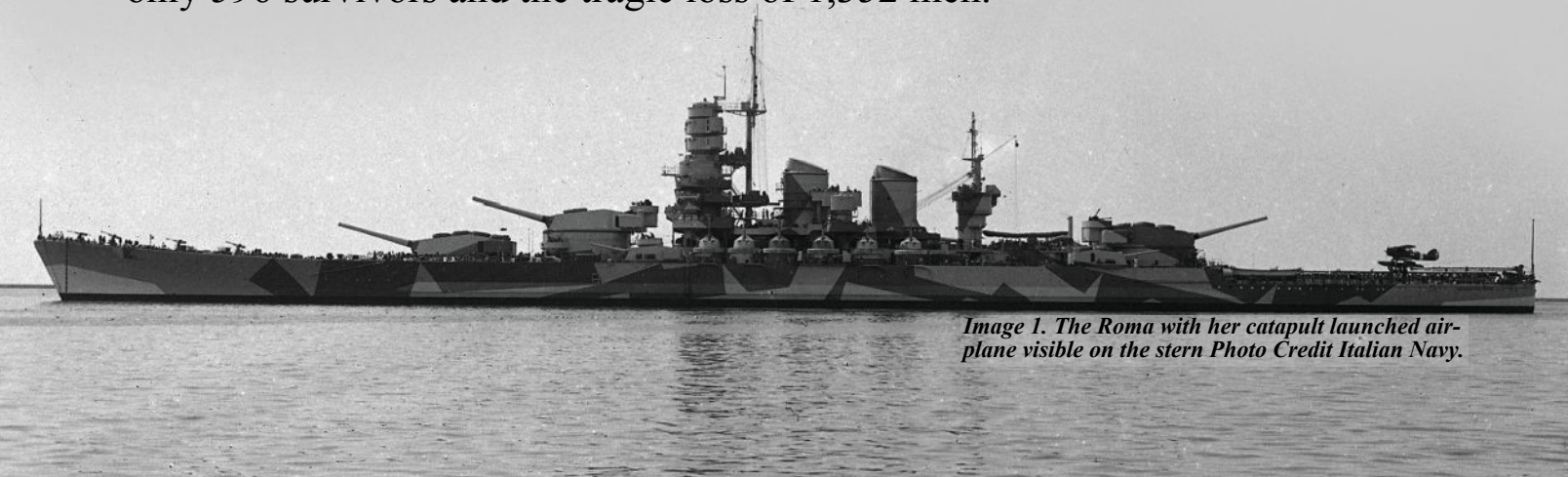

Image 1. The Roma with her catapult launched airplane visible on the stern Photo Credit Italian Navy.

Discovery

Guido Gay, a designer of underwater ROV technology for the Italian Navy, became interested in the history of the Roma. Thus, it became a personal quest to try and solve exactly where the Roma's remains came to rest. Gay's first attempt to locate the Roma began in 1980. In 2002, collaborating with the Italian Navy, another search effort was executed without success. Gay personally continued with the hunt from 2005 on. In 2012, he built his own side looking sonar that he used to survey the 1,200+ m deep canyons where he believed the Roma came to rest. This was a pole-mounted, single-sided side-scan, operating at 50 kHz. Using this technique, he found three targets that repeated, and he became convinced that these targets could be the Roma. He next deployed an ROV he built, called the "Pluto", from his sail boat in an attempt to identify if these sonar targets were the Roma. Success was realized in June 2012, when his underwater video clearly showed the remains of the Roma. Gay created a map of the wreck site, locating the bow and midsection, but he was unable to locate the stern section.

The Project

This project was made possible by the interest of Microsoft founder and philanthropist Paul Allen and with the support of his expedition yacht Octopus (Image 2). Mr. Allen is a history buff, especially in regards to the events of WWII. Upon hearing the story of the Roma and the discovery by Guido Gay, he sponsored an expedition to map the site using the latest AUV and ROV technology available today. Invited to participate in the expedition were Guido Gay, the discoverer of the Roma, the Italian Navy represented by Captain Lamberto Orlando Lamberti, and Ms. Maria Pia Pezzali, a journalist/researcher who specializes in the history of the Roma. The goals were to map and document with high positioning accuracy all parts of the wreck site and to locate the missing stern. Optimistically included in the mission goals was finding the airplane that was on the stern of the Roma, though this was considered to be a long shot. The team met the Octopus May 26 in Sardinia and departed May 27 to the Roma site. Operations were carried out through June 1, 2014.

Image 2. Expedition Yacht Octopus.

Challenging Location

The Italian Navy provided multi-beam data of the Roma area. To aid mission planning, the raw bathymetric data were processed onboard using Chesapeake Technologies SonarWiz Bathy software to generate a 3D map (Image 3) of the area in which the Roma was located. It was clear when reviewing the 3D map that "Murphy's Law" was at play. The wreck could not be in a worse location. It sat at the bottom of a 0.5 mi deep canyon that was only 600 m wide at the base. This particular site would be impossible to survey safely using traditional towed side-scan sonar systems.

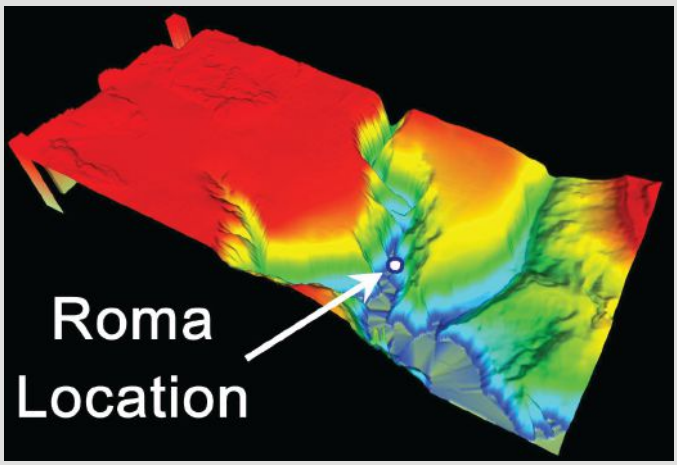

Image 3. Processed SonarWiz 3D Bathy showing Roma Location.

Phase 1: AUV Operations

The first phase was to map the wreck area in its entirety using high-resolution side-scan sonar. The survey was done using a Bluefin 12 AUV (Image 4) rated for 1,500 m depth and equipped with the latest EdgeTech 2205 100/400 kHz AUV side-scan sonar payload. The EdgeTech 2205 was the sonar of choice because of its superb deepwater performance as well as its proven track record. It had been used on the AUVs in the recent Malaysian MH370 search off Australia as well as the past Air France Flight 447 search in the Atlantic Ocean. Mission planning was challenging due to the severe terrain, but using a stepped approach over several AUV missions, the area was successfully and safely mapped. Once the sonar data were downloaded from each mission, they were brought into SonarWiz for processing and analysis. A complete sonar mosaic was made of the site, with the major wreck pieces and associated debris geolocated. This positioning data would be used in Phase 2 for the ROV mission planning to photo document the wreck site.

Image 4. Launching Bluefin AUV.

The missing stern section was successfully located in the mosaic, and it was lying partially embedded in the west canyon wall. The center section and bow section were lying at the bottom of the canyon. It was clear from the sonar data that the bow had slid partially down the east side of the canyon wall. This was evident by the large drag scar leading to its present location (Image 5). One of the high-priority objectives was to see if the airplane could possibly be located. GK Consulting, a consultant on the project, provided support with AUV mission planning and sonar data processing/analysis. The sonar data were analyzed, and a target that held a high probability of being the airplane was selected for further investigation during Phase 2 of the ROV operations.

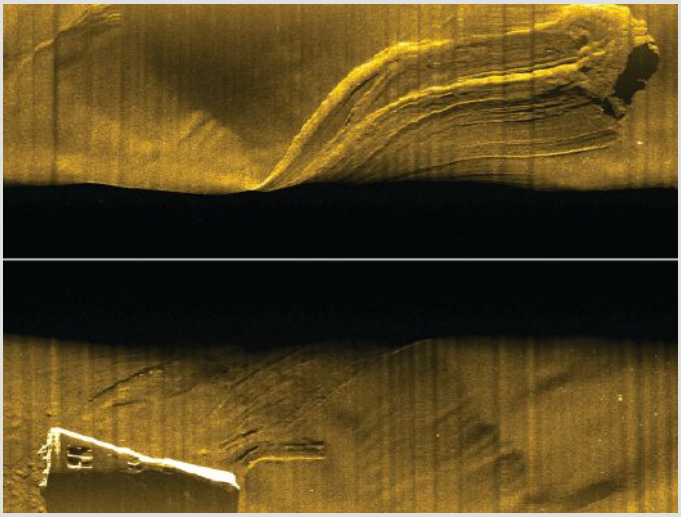

Image 5. EdgeTech sonar image showing Bow slid down canyon wall.

Phase 2: ROV Operations

Robert Kraft, the undersea project manager on board the Octopus, was keenly intrigued by the possible airplane contact in the sonar data. It was decided that this would be the target to check out immediately on the first ROV mission. Calculations for the plane-like target position were checked and re-verified as it was not that large of a target and time was not to be wasted driving the ROV around searching for it. The Octopus was stationed over the calculated target position using DP control, and the ROV began its descent to 1,200 m. As soon as the seafloor was acquired, the on-board ROV sonar detected the target and began moving in its direction. Slowly, the form of a mangled airplane materialized (Image 6). It was a great way to start the ROV Phase 2 missions, to have success in finding the most difficult objective right from the get-go.

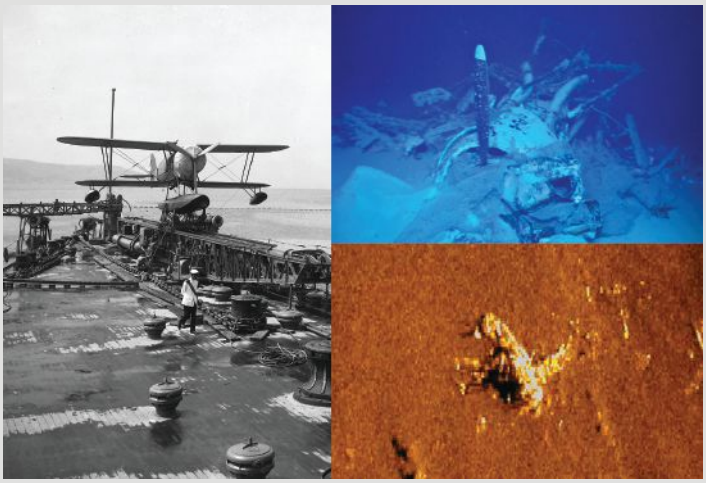

Image 6 The roma plane is located.

ROV operations continued over several days, documenting the wreck and associated debris. The AUV Ops Center was crammed with team members waiting for the camera to reveal each new discovery. Guido Gay had a grin on his face when viewing the real-time video of the wreck. That told the story and his satisfaction with the project. Visibilty on the bottom was superb, allowing large areas of the wreck to be imaged in a single view. Seeing the anti-aircraft guns poised and ready to fire (Image 7) took team members back to a time in history when the world was in chaos. Maria Pia, the journalist on board, showed the team a picture of the Roma's stern and mounted there was the Royal Crown of Italy. Was it still there and could we see it?

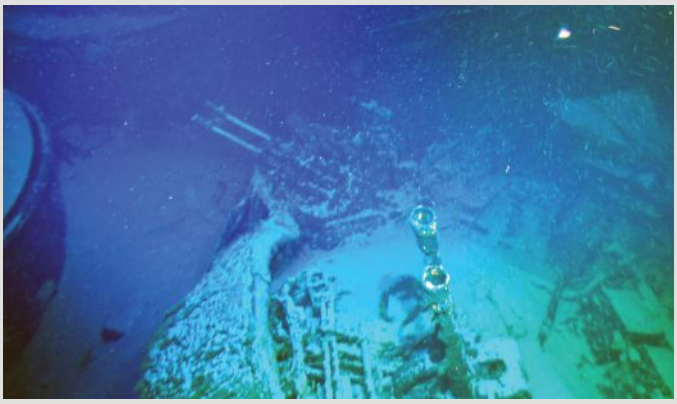

Image 7. Anti Aircraft Guns ready for action.

The last ROV mission dive was to explore the stern section of the Roma. The vehicle maneuvered down the starboard side, but it was found to be heavily embedded into the side of the canyon wall and the stern could not be accessed. The ROV worked across the fantail, and the remains of the airplane catapult launcher were clearly visible. On reaching the port side, the ROV worked aft and luck was with us, a scour around this section of the stern allowed the ROV to squeeze in for a look-see. There, under the illumination of the ROV lights, was the magnificent Italian Crown (Image 8).

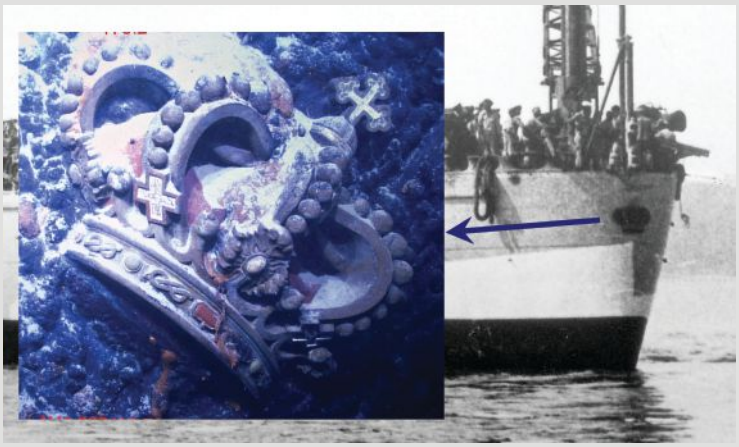

Image 8. Royal Crown of Italy Located.

Conclusion

The project set goals, and the end accomplishments exceeded all expectations. It showed how modern AUV and ROV technology can manage missions even in very difficult seafloor terrain. The Italian Navy came away with the most detailed map of the Roma site produced to date. Guido Gay came away with answers to his questions, which were the location of the stern and the airplane. Maria Pia had the final chapter for the book she is planning on writing, documenting the Roma. And the Octopus undersea operations team, managed by Rob Kraft, showed their proficiency in running a professional and first-class undersea operation. All in all, a win for everyone.

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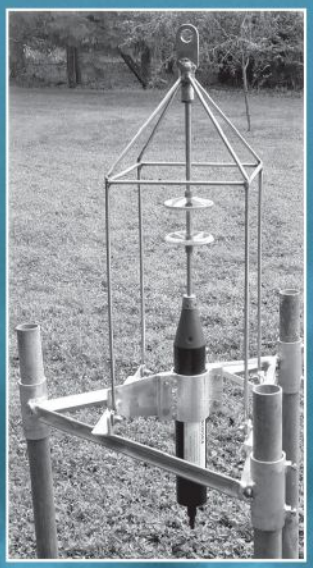
MAVS-4SL	•	•	•	•	•	•	2000 m. Logging
MAVS-4DD	•	•	•		•		6000 m. Real Time
MAVS-4DL	•	•	•	•	•	•	6000 m. Logging
MAVS-4WTG	•	•	•	•	•	•	Directional Wave/Tide
MAVS-4LAB	•				•		For Flume or Lab Tank
MAVS-4Analog	•	•	•	•	•	•	4 Chan Analog Output



OPTIONS

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Safe Boats International awarded contract for construction of patrol boats

Safe Boats International, LLC, Bremerton, Washington, is being awarded a $34,518,536 firm-fixed-price contract for the construction of four MK VI Patrol Boats. This contract includes options that, if exercised, would bring the total cumulative value of this contract to $52,295,843. Work will be performed in Tacoma, Washington (82%); Kent, Washington (7%); Wichita, Kansas (6%); New Zealand (3%); and in Canada and Berwick, Louisiana (less than 2%) and is expected to be completed by March 2018. Fiscal 2013 and 2014 National Guard and Reserve Component equipment account funds in the amount of $34,518,536 will be obligated at the time of award. Contract funds will not expire at the end of the current fiscal year. The Naval Sea Systems Command, Washington, District of Columbia, is the contracting activity (N00024-14-C-2230).

Sweden orders New Lightweight Torpedo

Saab has received an order from the Swedish Defence Materiel Administration (FMV) regarding design plans for a New Lightweight Torpedo (NLT). The order refers to the period 2014-2015 and amounts to the value of MSEK 43. The order is part of the Letter of Intent regarding the Swedish armed forces' underwater capability. This is the first step in developing a new lightweight torpedo. Final delivery of this order will be during 2015. "Saab Dynamics has over the years established a unique experience and expertise in developing underwater systems for shallow waters and the types of environment that exist in the Baltic Sea. Many of our systems are world leading in its segment, and with this order, we are able to maintain our global leadership position and continue to provide the market with competitive products," said Agneta Kammeby, vice president and head of business unit underwater systems.

Lockheed Martin awarded U.S. Navy C4ISR contract

Lockheed Martin will work to enhance how the Navy exchanges C4ISR data throughout the space, air, surface, subsurface, and unmanned sensor domains under a contract with Space and Naval Warfare Systems Center Pacific. This IDIQ contract has a ceiling value of $35 million over 5 years. "For the Navy, every platform is a sensor, and every sensor must be networked," said Dr. Rob Smith, vice president of C4ISR for Lockheed Martin Information Systems and Global Solutions. "We'll leverage our more than 30 years developing and fielding signals intelligence systems to increase the Navy's intelligence sharing capability across the full spectrum of maritime and littoral missions." Lockheed Martin co-developed the Navy's Distributed Information Operations-System, which addresses the Navy's need for network-centric intelligence to improve interoperability and enhance battlespace awareness. For that effort, Lockheed Martin connected disparate Navy signals intelligence systems facilitating tactical data exchange and allowing commanders to better understand their operational environment. Building upon those capabilities, Lockheed Martin will continue to enhance the Navy's signals intelligence collection, data fusion, and intelligence processing and dissemination capabilities. This could involve integrating and deploying capabilities that monitor the status of all sensors registered in the network, then displaying the input from those sensors in support of real-time planning. Network integration of sensors will be designed to accomplish cross-cueing, cooperative sensing and, where feasible and prudent, automated target recognition or classification. The workscope for this contract also includes analyzing ways to enhance the Navy's use of Unmanned Aerial Vehicles (UAVs) for surface combatant land attacks.

Bollinger delivers the CGC Raymond Evans

Bollinger Shipyards, Inc. has delivered the Raymond Evans, the tenth Fast Response Cutter (FRC) to the U.S. Coast Guard.

The announcement was made by Bollinger president, Chris Bollinger. "We are extremely proud to announce the delivery of the Raymond Evans, the latest FRC built by Bollinger, to the 7th Coast Guard District in Key West, Florida. The Raymond Evans, as well as the previous nine FRC deliveries, were proudly delivered on time and on budget. We look forward to the vessel's commissioning, honoring and celebrating the heroic acts of Commander Raymond Evans."

The 154-ft patrol craft Raymond Evans is the tenth vessel in the Coast Guard's Sentinel-class FRC program. To build the FRC, Bollinger used a proven, in-service parent craft design based on the Damen Stan Patrol Boat 4708. It has a flank speed of 28 kts, state-of-the-art command, control, communications and computer technology, and a stern launch system for the vessels' 26-ft cutter boat. The FRC has been described as an operational "game changer" by senior Coast Guard officials.

The Coast Guard took delivery on June 25, 2014 in Key West, Florida and is scheduled to commission the vessel in Key West, Florida during September 2014.

Each FRC is named for an enlisted Coast Guard hero who distinguished him or herself in the line of duty. This vessel is named after Coast Guard Hero, Commander Raymond Evans. Evans, who began his career as an apprentice seaman, was part of a dramatic rescue of a group of Marines pinned down by machine gun fire during the battle of Guadalcanal in September 1942 where he earned the Navy Cross. Evans performed his mission with valor and bravery.

For more information, visit www.bollingershipyards.com.

7th Fleet tests innovative missile defense system

U.S. 7th Fleet and the Navy Warfare Development Command (NWDC) tested how radar-absorbing, carbon-fiber clouds can prevent a missile from detecting and striking its target, June 21 to 25.

The Navy tested these manmade clouds, called maritime obscurant generator prototypes, to assess their tactical effectiveness for anti-ship missile defense.

The systems and tactics were tested under a variety of at-sea conditions using assets from the U.S. Army, Navy, and Air Force to evaluate how the radar-absorbing, carbon-fiber clouds can protect naval assets as part of a layered defense.

"Pandarra Fog showed the value of quickly bringing togeth-

er scientific and joint forces to tackle our hardest warfighting problems," said Antonio Siordia, U.S. 7th Fleet's science advisor. "This isn't just smoke or chaff, this is high-tech obscurant which can be effective against an array of missile homing systems."

A shipboard device generated the carbon-fiber particles that were suspended in a cloud of smoke. These clouds can absorb or diffuse radar waves emanating from the seekers of incoming missiles and potentially obscure friendly ships from those missiles.

The experiment demonstrated how maritime obscurant generation can be a key enabler of offensive maneuver of the Fleet despite the global proliferation of anti-ship cruise and ballistic missiles.

In addition to having a significant level of effectiveness, the systems are relatively inexpensive when compared to other countermeasures and can be tactically employed through typical Fleet maneuvers. The materials are environmentally friendly and sized to maximize operational effectiveness.

For more information, visit www.navy.mil.

Future USS Tripoli (LHA 7) keel authenticated

The keel laying and authentication ceremony for the amphibious assault ship, the future USS Tripoli (LHA 7), was held at the Huntington Ingalls Industries Pascagoula shipyard June 20.

Ship Sponsor Mrs. Lynne Mabus and retired Lt. Cmdr. Steve Senk, the chief engineer of the previous Tripoli (ex-USS Tripoli, LPH 10), served as the keel authenticators. The laying of the keel traditionally marked the first step in ship construction. With today's advanced modular shipbuilding, the keel laying ceremony now recognizes the joining together of a ship's components and is a major milestone in the ship's construction. Fabrication of Tripoli started in July 2013.

Like the recently delivered America (LHA 6), LHA 7 incorporates key components to provide the fleet with a more aviation-centric platform. The design of the future Tripoli features an enlarged hangar deck, realignment and expansion of the aviation maintenance facilities, a significant increase in available stowage for parts and support equipment, and

increased aviation fuel capacity. The ship will also be the first LHA replacement ship to deliver fully ready to integrate the entire future air combat element of the Marine Corps to include the Joint Strike Fighter.

Along with its pioneering aviation element, LHA 7 incorporates the fuel efficient gas turbine propulsion plant, zonal electrical distribution, and electric auxiliary systems first installed on USS Makin Island (LHD 8). LHA 7 will be 844 ft in length, will have a displacement of approximately 44,971 long tons, and will be capable of operating at speeds of over 20 kts.

For more information, visit www.navy.mil.

BAE Systems wins service contract for RN destroyers

The UK's Ministry of Defence has awarded BAE Systems a £70 million contract to manage the support, maintenance and upgrade of the Type 45 Destroyers at Portsmouth Naval Base and on all their operations in the UK and globally.

The contract will sustain 100 roles at BAE's site in Portsmouth and is due to commence in July 2014 and run until the end of November 2016.

The contract underlines BAE's capability in servicing and upgrading the Royal Navy's fleet. The Company currently services the Royal Navy's four River Class Vessels under a £22 million contract awarded last year and services all Type 23 ships based at Portsmouth in addition to managing HM Portsmouth Naval Base for the Royal Navy.

The servicing and support of all the warships in the Daring Class is managed by the Type 45 Class Output Management (COM) Team based at Portsmouth. Comprising Royal Navy, Ministry of Defence and industry personnel, the Team ensures the Type 45 ships are available to meet all Royal Navy requirements and manage capability upgrades as well as the provision of spares and support worldwide. The COM Team provides one point of contact for Type 45 personnel on board.

The six Daring Class Type 45 ships–HMS Daring, HMS Dauntless, HMS Diamond, HMS Dragon, HMS Defender and HMS Duncan–are the largest and most powerful Air Defence Destroyers ever operated by the Royal Navy. Designed and built by BAE Systems, the ships were designed to take into consideration future engineering, maintenance and upgrade requirements thus ensuring their longevity.

For more information, visit www.baesystems.com.

Polish Navy chooses Saab system for MCMV

Saab announced that the Polish Navy has chosen Saab's Double Eagle system for the Kormoran II MCMV. The Double Eagle is a state-of-the-art, well proven, low-risk and extremely efficient mine countermeasures (MCM) underwater vehicle.

The Double Eagle concept uses a modular approach to provide flexible systems for MCM and maritime security. It is aimed at providing a hydro dynamically stable, highly reliable system with exceptional performance and low life cycle cost. The Double Eagle, available in MkII, MkIII and Sarov versions, is used by navies around the world on many types of ships. It has also been adapted to the craft of opportunities (COOP) concept where the Double Eagle is integrated in a container that easily can be installed on almost any type of ship.

The design was from day one targeted on modular design and open architecture with the possibility to replace main system elements. This allows upgrades and reconfiguration, enabling use of new technology and changes in naval tactics/strategy as part of an evolutionary strategy. This has led to a system where core functionality and core subsystems have been reused in several products and configurations, all to provide system with extreme stability yet still highly manoeuvrable.

For more information, visit www.saabgroup.com.

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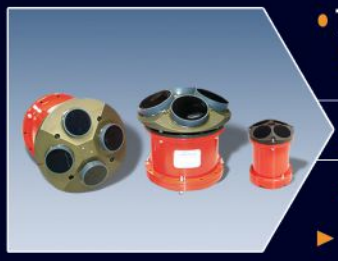

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TECHNOLOGY OF THE *DEEPSEA CHALLENGE* EXPEDITION

(Part 3 of 3: *DEEPSEA CHALLENGER*)

By: Kevin Hardy, Global Ocean Design LLC; Bruce Sutphen, Sutphen Marine LLC; and James Cameron, Earthship Productions LLC

INTRODUCTION

This required a gut check of epic proportions. "When you gaze long into an abyss, the abyss also gazes into you," understood German philosopher Friedrich Nietzsche in 1886. With that, Explorer and Filmmaker James Cameron radioed the command to release the surface flotation and began his journey downward solo inside ***DEEPSEA CHALLENGER* (*DSC*)** to take on the towering odds against surviving the most extreme hyperbaric environment on Planet Earth: the western Pacific Ocean's Mariana Trench (Figure 2).

It is a place where animals are accustomed to seeing bioluminescence not sunlight, an evolutionary result of 3.8 billion years of total darkness in that strange Other Earth far below the photic zone. Here is where ambient pressure could have the units, "tsi," as in "tons per square inch."

This is the final chapter in a three-part series that describes the new and legacy technology that defined the operational success of the ***DEEPSEA CHALLENGE*** Expedition.

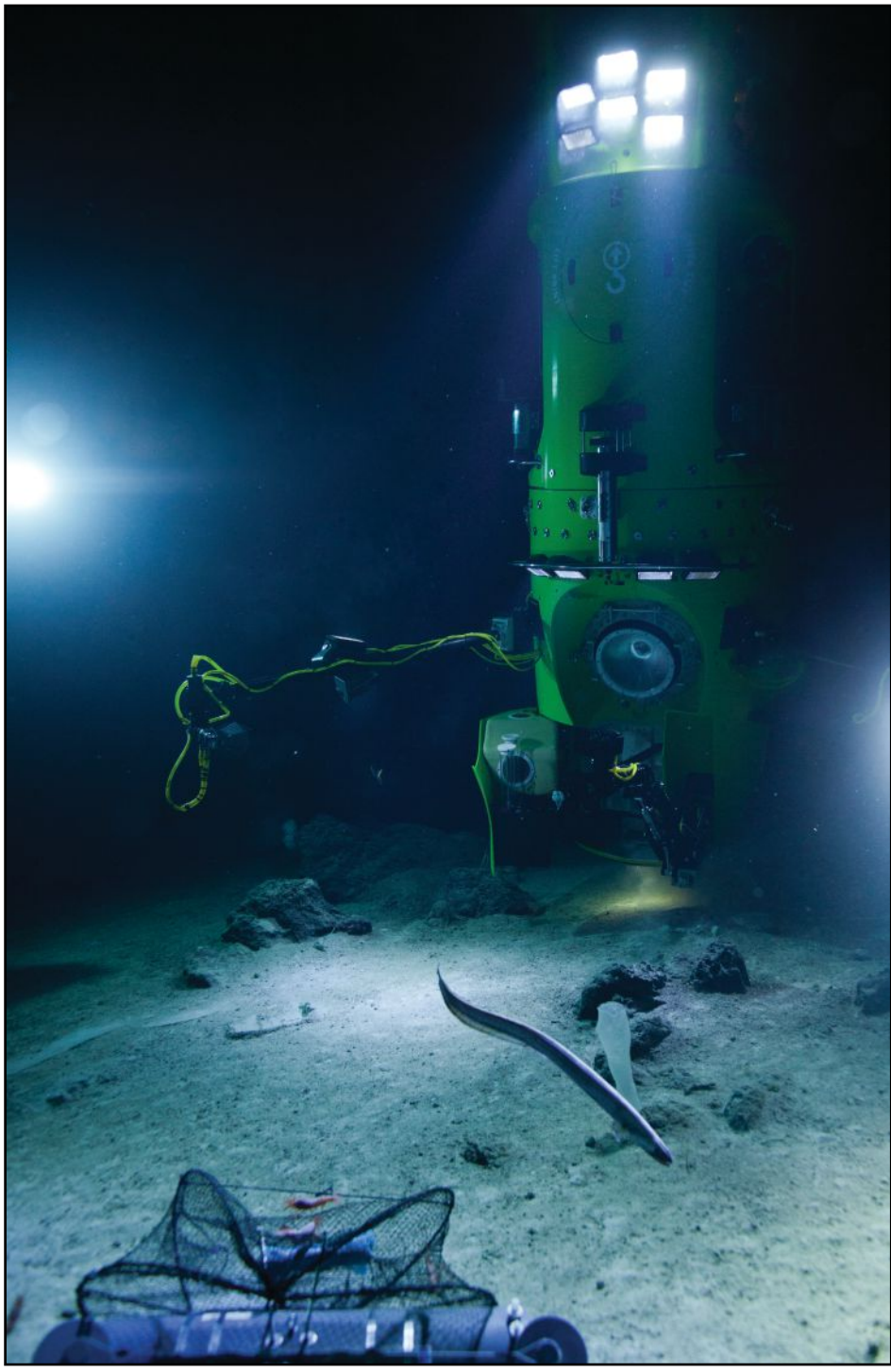

Figure 1. Co-designer Ron Allum pilots the DEEPSEA CHALLENGER across the rocky bottom at 850m near Falalop Island, Ulithi Atoll, Caroline Islands, FSM. Visible is the 2m camera boom, pan-tilt and stereo mini-cam, the manipulator, and conical viewport of the pilot sphere. The science bay door below the pilot sphere is seen open. Photo by Earthship LLC.

Ballast and Trim

Unlike the Trieste, the ***DEEPSEA CHALLENGER*** does not require descent weights to get to the trench floor. The buoyancy of the ***DSC*** increased with depth because its net volume changed less with hydrostatic compression than seawater. Therefore, the vehicle is ballasted on the ship to be neutrally buoyant at the target depth of the given dive.

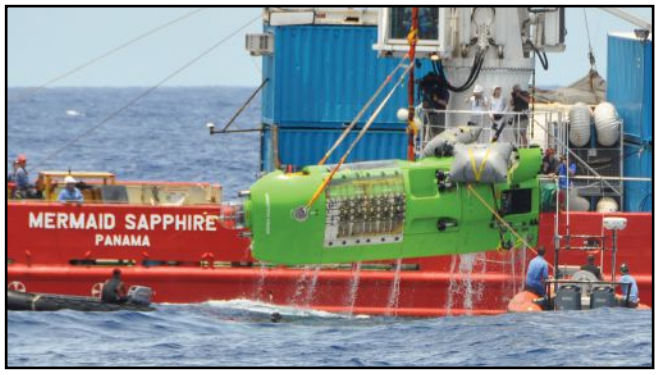

Figure 2. The submersible DEEPSEA CHALLENGER, with Explorer James Cameron inside, is lifted aboard the M/V Mermaid Sapphire following its deep dive into the East Pond of the Challenger Deep in the Mariana Trench. Photo by Chris Symons. Used with permission, Earthship LLC.

An adjustable-trim system using steel-shot held by an electromagnet is incorporated to allow the vehicle to maintain neutral buoyancy when taking on samples or exploring up a slope or a rising feature.

The ascent weight system provides the vehicle with a safe return to the surface (Figure 3). There are five levels of redundancy on three separate circuits. The primary method of dropping the weights is a pilot-operated switch that cut the power to the electromagnetic coils holding the lever arms supporting the weights. The circuit can also be opened by an acoustic command from the surface in the event the pilot is incapacitated. If there is a power failure or the vehicle runs out of battery power, the electromagnetic coils will likewise de-energize and drop the weights. The second circuit uses a Frangibolt, similar to those used on DSV Alvin to drop its manipulator in case of emergency.

Figure 3. The ascent weights with multiple release means. Photo by Chris Symons. Used with Permission, Earthship LLC.

The third circuit uses a "GTR," or galvanic time release, a bimetallic fuse that corrodes at known rate (e.g., 18, 24, 36 hrs). Three are used in parallel to provide the proper strength at the preferred time interval. The rate of galvanic corrosion is based on the ratio and mass of the anodic and cathodic materials, plus salinity and temperature of the ambient seawater. A significant effort went into calibrating these fuses to avoid a premature release that would unintentionally abort the dive.

Pressure Hull

The 43-in. diameter x 2.5-in. thick pressure hull is fabricated from high tensile steel EN26, invented in the 1940s for use in large Howitzer-type gun barrels. It is an alloy similar to that used on DSV Trieste's pressure hull in its 1960 deep dive (Figure 4).

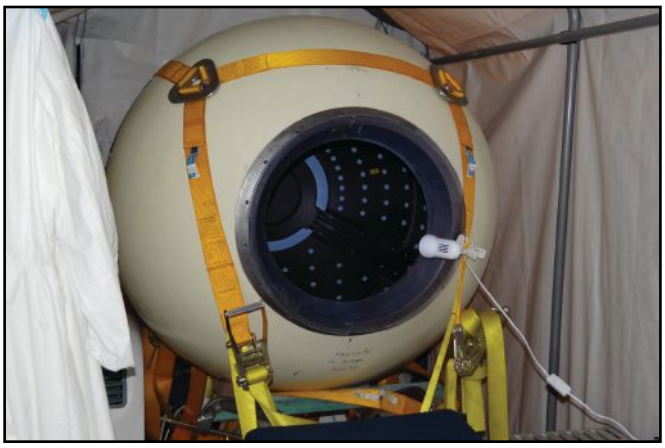

Figure 4. DSC pressure hull with interior view of carbon fiber plastic inner shell. Photo by Ron Allum. Used with Permission, Earthship LLC.

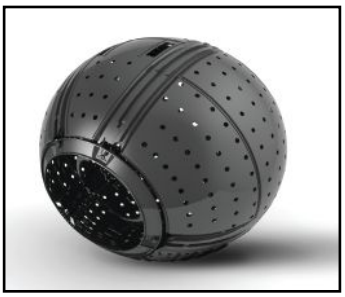

Figure 5. Multi-part, carbon-reinforced plastic inner shell of the pilot sphere. Photo by Liam Mahoney, LSM Advanced Composites. Used with Permission, Earthship LLC.

All the equipment populating the pilot sphere is mounted to a high-temperature cure phenolic resin "whiffle ball" made by LSM Advanced Composites (Figure 5). This approach mitigated the need for any hard point fastenings to the pressure hull, while still allowing a dense packing of the interior space. Additionally, this shell-within-a-shell provides thermal isolation for the pilot and collection of condensation away from electronic circuits.

Acrylic Viewport

The hatch, situated at the lower pole, incorporates a custom-designed conic acrylic viewport with a refractive index similar to seawater (Figure 6). The interior curvature of the viewport corrects for the 30% magnification that occurs with the change in refractive index from water-to-air through a flat plate viewport. The viewport was used for either pilot viewing or high-definition video.

Lights and Cameras

A 7-ft tall bank of 21 high-efficiency PBOF LED floodlights, affectionately called "light bricks," are mounted to the face of the sub above the pilot sphere. Each light brick produces 3,000 lumens of white light. Another five light bricks were placed at strategic points on the sub. Above the 21 light bricks are two "Ty" lights. These unique PBOF LED lamps each produce 42,000 lumens in a spot pattern. Together, these provide immense light in the clear water of the deep ocean, easily illuminating up to 100 ft ahead of the sub. The lights can be turned on and off in banks by the pilot to vary the intensity for up-close imaging or wide-angle distance shots.

A 3-D HD CPG video pair is attached with a pan-and-tilt to an external 6-ft boom with 200-degree slough providing additional spacial awareness to the pilot. On the opposite side of the

vehicle, a similar, but shorter boom is outfitted with a third "Ty" light, the 42,000 lumen PBOF LED spotlight.

Figure 6. The DSC's conic acrylic viewport. Photo by Bruce Sutphen. Used with Permission, Earthship LLC.

Inside the sphere, the pilot can attach a Red Epic, an IMAX-quality 5K digital camera, to the interior of the viewport. The pilot then views images on an interior video display. A small video camera pair inside the sub captures 3-D images of the pilot.

Life Support

The life support system inside the ***DEEPSEA CHALLENGER*** is a dual closed-circuit rebreather system designed and developed by Ambient Pressure Diving (APD) working with John Garvin, life support specialist for Acheron. The system consists of a primary rebreather that feeds the cabin and a secondary "Bail Out reBreather (BOB) that is "closed loop" and used only in an emergency. The primary system provides over 100 hrs of life support under normal operating conditions. The back-up system utilizes the most current closed circuit rebreather technology to provide the pilot with a fully redundant system in case of an emergency. A small hand-held atmospheric analyzer, the Geotech G100, monitors the cabin's carbon dioxide level as a back-up to the APD system.

Lower Pod

The lower pod is a substantial fiber-reinforced toughened epoxy structure that fits over and around the pilot sphere on the main vehicle (Figure 7). In addition to housing the hydraulics, compensators, robotics, science payloads, adjustable trim, and ascent weight systems, it also protects the pilot sphere by absorbing an impact with the seafloor by flowering the components away from the sphere and redirecting the remaining load into the structural syntactic beam. While robust, the lower pod maintains the graceful lines of the sub's hydrodynamic body.

Figure 7. The lower pod during construction. Photo by Bruce Sutphen. Used with Permission, Earthship LLC.

Other design elements

There is a design mandate that every implodable volume on the manned vehicle be filled with Fluorinert, a 3M product used in transformers. The crystal-clear, high-dielectric fluid has a specific gravity of 1.9 that has to be considered in calculating buoyancy and trim. The housings in question include the external MetOcean strobes and RDF beacons and the Iridium phones, packaged in a 10-in. diameter Nautilus-Marine Vitrovex glass spherical housing.

Subsurface Communications

The ***DSC*** uses an L3 Nautronix long-range acoustic modem to transmit and receive both voice and data communications. It can also calculate total distance (range) between modems. The L3 was initially envisioned to provide two-way data and communication between the triad of vehicles—the ***DEEPSEA CHALLENGER*** submersible, the M/V Mermaid Sapphire, and the twin unmanned Landers—and substantially achieved that goal.

The L3 Nautronix system uses matched acoustic modems that operate between 8 and 12 KHz and can transmit voice further than 15 km. This had been tested at horizontal distances, but never to depths of 11 km. Thermoclines, haloclines, varying densities, and surface noise all affect the performance of the system. As the project progressed to deeper depths, the methods of operating the system changed empirically to improve the odds of success.

The transmitted source level is attenuated significantly through 13 to 15 km of slant range; therefore, the L3 Nautronix was designed with a very sensitive receiver. In the field, this sensitivity makes background noise the largest problem, mainly that generated by ship's propulsion and machinery and picked up by the topside transceiver hydrophone. Eventually, the entire topside transceiver system was placed in a RHIB (Rigid Hull Inflatable Boat) boat with its dunking transducer suspended on a long cable, increasing the distance from the mother ship's noise to clearly resolve the attenuated signal from ***DEEPSEA CHALLENGER***.

The control system of ***DEEPSEA CHALLENGER*** automatically uses the data modem feature to transmit measured depth, O2, and CO2 levels inside the hull, battery voltages, and other critical information. For this mode, a PC running a small application was connected to the L3 acoustic modem.

The submersible pilot and shipboard communication team can also communicate using text messages.

Pilot Training

Using the same male tool for fabricating the pressure hull, two additional pilot spheres were made using 5/8-in. carbon steel. The first was used for the pilot sphere ergonomic and general arrangement/equipment layout. It was then integrated into a refrigerated simulation chamber for conducting pilot and emergency training with all of the systems and components that are in the actual ***DSC*** vehicle's pilot sphere. The second sphere was not used.

Emergency Procedures

Provision is made to jettison the entire ascent weight system, and the adjustable ballast system on the science door in the event of entanglement. In case of fire and noxious gases, the pilot has a separate closed-circuit emergency breathing system with a full face mask as described above. Provision is made for pilot egress at the surface with the submarine still in the water.

Future

The ***DEEPSEA CHALLENGER*** submersible was gifted to Woods Hole Oceanographic Institution where it will be conserved and studied to identify innovations that can be harvested and applied to future vehicles of all classes. For further information contact Anthony Tarantino at atarantino@whoi.edu.

More information on the submersible and landers may be found online at http://deepseachallenge.com and http://www.whoi.edu/main/deepseachallenger.

Watch for the movie ***DEEPSEA CHALLENGE*** 3D in theaters on August 8, 2014.

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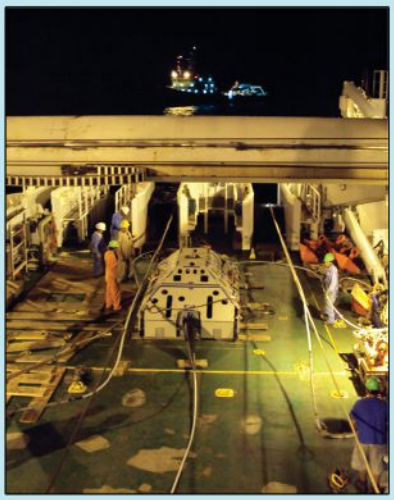

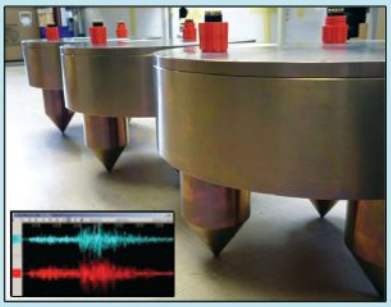

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OFFSHORE INDUSTRY

in this section

U.S. oil spending could hit $165B on global conflicts: Barclays report

Oil and gas producers could boost their annual spending to $165 billion in the United States as conflicts in Iraq and elsewhere send crude prices higher, according to a report released by Barclays. Exploration and production spending is expected to jump 9.6% over last year, according to the London bank.

North American operators are putting more muscle behind oil production, and already have made slight adjustments to their outlook for this year's oil prices, their benchmark for spending budgets.

"Given the conservative commodity price assumptions currently driving spending, we think North American E&Ps could be in position to outspend their budgets by the end of the year," Barclays analysts wrote in the report of exploration and production companies.

Forty-two percent of U.S. exploration and production companies told Barclays they would increase their capital spending budgets if West Texas Intermediate crude prices kept hovering around $100 a barrel. None of the companies Barclays surveyed said they would drop spending at current prices, "which we think provides strong evidence that actual E&P spend will outpace current expectations."

A big part of the increased growth: West Texas. Oil companies have boosted the number of rigs in the Permian Basin this year, driving the nation's rig count to the highest level in 2 years, before multi-well-pad drilling spread throughout the rig market and allowed operators to cut back on rigs and drill more wells.

Lawmakers urge Obama to keep drilling away from Atlantic Coast

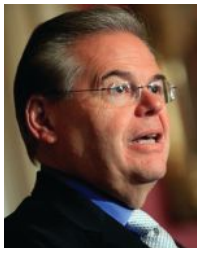
Members of New Jersey's congressional delegation are urging U.S. President Barack Obama to keep offshore oil drilling away from the Atlantic Coast.

U.S. Senators Robert Menendez and Cory Booker, as well as Congressman Frank Pallone, have sent a letter to the president to keep the Atlantic Coast off limits for oil and gas exploration. They noted that the environmental and economic consequences of an oil spill near the Jersey Shore would be catastrophic.

Citing the Deepwater Horizon tragedy, the senators and congressman said offshore drilling poses a substantial risk of economic and environmental devastation for the shoreline communities.

The letter said:

"Even today, more than four years after the BP oil spill, 60% of the 210 million gallons that spilled are unaccounted for and oil-soaked sand and tar balls continue to wash up on the beaches of the Gulf. The Jersey Shore is a priceless natural treasure, providing recreation to generations of families and supporting a thriving ecosystem of marine mammals and sea life. We owe it to future generations to ensure that our pristine natural resources are preserved and protected from the polluting fossil fuel industry."



Robert Menendez

In June, the Bureau of Ocean and Energy Management (BOEM) unveiled the initial steps in the development of the 2017-22 Outer Continental Shelf (OCS) Oil and Gas Leasing Program.

U.S. ahead of Saudi Arabia as largest oil producer in the world

The United States has grabbed the title of the world's leading crude oil producer from Saudi Arabia and is expected to remain there till 2030, according to the Bank of America. Total crude oil production in the United States, including liquids separated from natural gas, was the highest compared to all other countries in the first quarter of this year, according to a report released by the Bank of America. The United States' crude oil output in the first quarter of 2014 surpassed 11 mmbbl per day, the highest volume produced by the nation in 24 years, as production from shale formations in Texas and North Dakota was ramped up.

According to the International Energy Agency (IEA), a Paris-based consultancy, U.S. oil production will reach 13.1 mmbbl per day by 2019. According to the Bank of America, the country is expected to hold its spot as top oil-producing country this year, because production in the second half of the year is expected to be increased further. However, the IEA has also said that the United States will lose its top spot in the 2030s due to its limited resource base, while the Middle East will re-emerge as a top force again as it has abundant and low-cost resources at its disposal.

Survey finds majority of North Sea oil workers want independent Scotland

A survey by Oilandgaspeople.com found that a majority of North Sea oil and gas workers will vote in favor of an independent Scotland. A poll of more than 1,000 workers found that 64% plan to vote yes in a referendum that is due to take place this September.

In a separate survey, more than half of 5,000 workers said they wanted to see more investment in British training.

Another 31% said production and efficiency of oil fields needs to be improved drastically, and 51% said skills shortage is a major issue.

About 24% of the workers called for the establishment of a government-appointed and beefed-up regulator for safety and efficiency improvements in the industry.

Oilandgaspeople.com chief executive Kevin Forbes said: "The survey ...

has found that the workers in the North Sea oil and gas industry want an independent Scotland. They clearly don't believe the concerns that Scotland's economy will suffer after independence."

However, the survey also found that while the workers are keen on independence, manyl believe that many issues still need to be addressed urgently to effectively safeguard the future of the industry.

"We're delighted with the findings of this survey, which show that oil and gas workers overwhelmingly back Yes," Scotland trade union coordinator Cailean Gallagher said. "They are the ones who know their industry best and know that oil and gas will continue to play a key role in the Scottish economy for decades to come."

Gallagher alleged that Westminster misused £300 billion of oil and gas tax revenues, but said there is still even more value to come from the North Sea than has been generated to date.

UK launches research center to address worldwide subsea issues

A new research center has been launched to address challenges that are being faced in the UK Continental Shelf (UKCS) and the worldwide subsea industry. The National Subsea Research Institute (NSRI), which is a partnership between the UK subsea industry and academia, intends to develop and lead a coordinated research strategy for the country's oil and gas subsea sector.

The center will support the development of subsea technologies to increase the levels of hydrocarbons recovery and the life of the UKCS.

"NSRI will become the single voice on subsea technology in the country," said John Mair, Subsea UK board member and NSRI steering group leader. "As the 'go-to' advisory body and knowledge center for subsea technology, it will essentially broker the development of subsea technologies, rather than seek to fund R&D activity itself."

Mair said that the country currently needs an industry-led body to build stronger links between industry and academia, as countries such as Brazil and Norway are continuing to invest in deepwater research.

The organization will access and represent all the subsea companies and potential academic partners by operating across the entire UK. Scottish Enterprise, Subsea UK and industry have initially provided funding for the initiative for a period of 3 years.

Frontier study analyzes conditions for future E&P in Russian Arctic

The Arctic Research and Design Center, a joint venture of Rosneft and ExxonMobil, has completed its 2014 Kara Sea winter expedition.

Based on the findings the JV will construct 3D models of ice features to allow Rosneft to determine safe points for exploration works; design drilling platforms other structures for oil production; and to select routes for transportation of hydrocarbons and offshore pipelines.

According to Rosneft, this was the largest expedition in the Russian sector of the Arctic Ocean since the days of the USSR. During the 63-day campaign scientists studied the undeveloped Laptev, Kara, and East-Siberian seas from onboard the Yamal ice-breaker vessel.

Additional work was performed off the coast of Novaya Zemlya, the Severnaya Zemlya archipelagoes, and the De Long Islands. The team conducted ice and meteorological measurements at 35 stations and installed 40 drifting buoys at

The Russian ice-breaker vessel Yamal

ice fields and icebergs, with the westernmost buoy placed offshore Novaya Zemlya and the easternmost along Bennett Island in the East Siberian Sea. The buoys allow constant monitoring of the coordinates of ice features and help determine which way they are drifting.

According to Rosneft, the scale of these studies in Arctic seas is unprecedented. Also, this was the first time that physical and chemical properties and morphometric parameters of icebergs and hummocks have been studied in the Laptev Sea, along with water mass distribution, stream, and temperature variations.

As for iceberg drift studies along the Severnaya Zemlya archipelago, the majority of the icebergs (about 2,000) were recorded along the eastern coast. One giant iceberg was observed along Matusevich inlet measuring 1.86 by 0.6 mi.

The project involved use of remotely piloted vehicles and a KA-32 helicopter to monitor ice coverage, and Gnom remotely operated vehicles diving to 328 ft underwater to explore the seafloor.

Additionally, scientists observed oceanic mammals and birds to evaluate the potential impact of oil production on the local environment.

Global energy demand increased in 2013, but at slower pace: BP

Global energy demand accelerated in 2013 but, reflecting the weakness of the global economy, growth of 2.3% remained slightly below the historical average, according to BP's annual Statistical Review of World Energy 2014, released in mid-June at the World Petroleum Congress meeting in Moscow, Russia.

Within this global picture, however, shifts in energy consumption mirrored those in the world's economic patterns, BP reported noting that energy consumption in the emerging economies grew below their long-term average rate, rising by 3.1%, driven by slower growth in China. However, consumption in the mature economies of the OECD grew by a higher-than-average rate of 1.2%, entirely as a result of strong growth in the United States. As a result the gap between growth in the OECD and non-OECD narrowed to levels not seen since 2000.

Nonetheless, the emerging economies continue to dominate the growth in global energy demand, accounting for 80% of growth last year and nearly 100% of growth over the past decade.

The Review, the publication's 63rd annual edition, also illustrates how geopolitical events in a number of countries continued to impact oil production in 2013, with Libya suffering the largest single decline in the face of renewed civil unrest. Those disruptions, however, were offset by a big increase in oil production in the United States, driven by the massive investment in production from shale and other tight formations. As a net result, average oil prices remained unusually stable, albeit at levels exceeding $100 per barrel for a third consecutive year.

"The Review again demonstrates the strength of the flexible global energy system in adapting to a changing world," BP Group chief executive Bob Dudley said at the launch in Moscow. "The major disruptions to production seen throughout 2013 were balanced by continued rises in production elsewhere. This underlines the importance of continuing to secure these new supplies through continued access to new resources, policies to encourage markets and investment, and the application of new technologies worldwide."

Bob Dudley

The developments also highlighted the critical importance of both policy and market forces in delivering new supplies. As BP chief economist Christof Rühl noted, "the huge investments seen in the U.S. have been encouraged and enabled by a favorable policy regime. And this has resulted in the U.S. delivering the world's largest increase in oil production last year. Indeed, the U.S. increase in 2013, up by 1.1 million barrels a day, was one of the biggest annual oil production increases the world has ever seen."

The highly subsidized renewable energy industry now accounts for more than 5% of global power output and, including biofuels, for nearly 3% of primary energy consumption, BP said.

Energy industry belief in U.S. independence grows: KPMG

More oil and natural gas company executives believe the United States will be able to satisfy its energy needs without having to rely on other countries by 2030, according to a KPMG International survey.

However, federal waters of the Gulf of Mexico and onshore federal lands are contributing little to fuel the tremendous production growth underway in the United States. In fact, an Energy Information Administration (EIA) report found that oil and natural gas output in the U.S. Gulf alone declined in 2013. The region saw a 74% decrease in gas production from 2003, while oil production declined from 584 mmbbl in 2010 to about 447 mmbbl last year.

Rather, the United States is shedding its reliance on foreign energy sources thanks to technology that's allowed it to tap hard-to-reach onshore oil and gas in shale formations largely on private lands in North Dakota, Texas, Pennsylvania, Colorado, Wyoming and Oklahoma. U.S. crude output topped 8.47 mmbbl a day in the second week of June, the most since October 1986, and will average 9.27 million in 2015, according to the EIA.

"Exciting new breakthroughs are leading to a whole new generation of domestic oil and gas production, particularly from deepwater, oil sands and shale assets," John Kunasek, national sector leader for energy and natural resources for KPMG LLP, said in the statement.

However, crude oil production in the U.S. Gulf could to start to recover in coming years, as companies restart major projects delayed after the 2010 Deepwater Horizon rig explosion.

Seventy-three percent of energy executives surveyed by KPMG said the United States can become energy independent within the next 16 years or sooner. That's up 10 percentage points from its 2013 survey, according to the audit, tax and advisory services firm.

The survey of more than 100 senior executives in the United States representing global energy companies also found that the officials say oil and gas prices will stay relatively stable this year. Forty-seven percent of respondents say the average price of natural gas for 2014 will be in the range of $3.76 per million British thermal units to $4.50, while 44% of respondents expect Brent crude this year will average from $106 a barrel to $111, KPMG said in the statement.

The survey also found that energy executives in the United States expect mergers and acquisitions in their industry to be brisk over the next 3 years and the U.S. economy to continue to strengthen.

First step toward next 5-year lease schedule for offshore U.S.

The U.S. Interior Department has taken the first step in planning new offshore oil and gas leases sales from 2017-2022. The department's "Request for Information," or RFI, calls on stakeholders and interest groups to provide public comments on where across the Outer Continental Shelf (OCS) to sell leases for the 5-year span.

"Today marks the first step of engaging interested parties across the spectrum to balance the various uses and values inherent in managing the resources of federal offshore waters that belong to all Americans and future generations," Interior Secretary Sally Jewell said in a statement.

The request, published in Federal Register, officially opens the books to a wide range of options. Interior must consider sales in all 20 OCS planning areas. Publication of the RFI on June 13 began a 45-day comment period. However, substantial public involvement and extensive analysis will accompany all stages of the planning process, which will take up to 3 years to complete.

Interior said it will seek a wide array of input on the economic, social and environmental benefits of all the resources, and the possible impact of oil and gas exploration on marine, and human environments.

Interior will next prepare a Draft Proposed Program, followed by a Proposed Program and a Proposed Final Program.

Meanwhile, prominent oil lobby American Petroleum Institute (API) is pressing Interior to consider areas that are otherwise off limits.

"The department should thoroughly analyze the entire resource-rich areas of interest," API policy adviser Andy Radford said on a conference call with reporters. He said that Interior should "draft an expansive leasing plan that maintains current leasing areas and seeks to unlock new areas that are currently off limits."

"The United States has a long and successful history of producing oil and natural gas offshore, but government restrictions keep 87% of federal offshore waters locked away," Radford added.

The API stressed that estimates from the International Energy Agency said if U.S. production plateaus, it will fall behind OPEC countries.

"Opening new areas like the Atlantic and eastern Gulf of Mexico would send a signal to the markets and to the world that America's oil and natural gas renaissance is here to stay," Radford said.

Subsea 7 S.A. awarded $50M contract in Gulf of Mexico
Subsea 7 S.A. was awarded a contract in the U.S. Gulf of Mexico by Freeport-McMoRan Oil & Gas in support of its development of the KOQV and Holstein Deep fields. The contract value is in excess of $50 million. The scope of work covers the installation of flexible pipelines and umbilicals for both fields, with the offshore installation phase expected to be executed by the Subsea 7 vessel the Seven Seas in the fourth quarter of 2015. Onshore project management and engineering will be carried out from the company's Houston, Texas office. Olivier Carré, Subsea 7's senior vice president of Africa and the Gulf of Mexico, said, "This is the first deep-water project for Freeport-McMoRan Oil & Gas and we look forward to building and developing our partnership with them. Subsea 7's track record in managing and executing projects of this nature, working closely with the client, was key to our success in securing this contract."

Woodside commissions Browse FLNG geotechnical study
Global geosciences company Benthic was awarded a contract by Woodside Energy Ltd. to undertake an offshore geotechnical site investigation for the proposed Browse FLNG development off the northwest coast of Western Australia. The survey will assist with further understanding details of the seabed features of the Browse gas fields. Operating from the vessel Nor Captain, Benthic's portable remotely operated drill (PROD) will complete in-situ testing and sampling, with penetration depths up to 328 ft below the mudline, in water depths of 2,297 ft. PROD has executed three previous projects in adjacent sectors of the Browse fields, providing Woodside with real-time experience and knowledge of the fields' seabed conditions. The 2-month geotechnical investigation was expected to begin in mid-June.

Eni Norge AS enters into supply agreement with DNV GL
Eni Norge AS awards DNV GL a framework agreement for the supply of inspection services to the Goliat platform in the Barents Sea. The term of the contract is 3 years, with an option for a 2-year extension. The assignment consists of planning and carrying out inspections of static equipment, load-bearing structures and offloading and anchoring systems aboard the Goliat FPSO during its operational life. The contract, which will help further reinforce the petroleum cluster in Northern Norway, is in line with Eni Norge's ambition to create spin-off effects connected with the Goliat project. DNV GL has experience working for Eni Norge from the company's Harstad section, for example in the field of oil spill contingency. In connection with the new agreement for inspection services, DNV GL sees potential for moving personnel to Hammerfest. Also DNV GL subcontractor ApplusRTD will establish a branch office in Hammerfest during the coming year. The contract underpins DNV GL's established business strategy for growth in Northern Norway and heightened focus on services connected with Arctic operations. Goliat is the first field to be developed in the Norwegian sector of the Barents Sea, and one of the biggest industrial projects ever undertaken in Northern Norway. The cylindrical Goliat platform is a floating production, storage and off-loading unit (FPSO), and is full of unique technological systems. The estimated reserves in the field are 174 mmbbl of oil and 8 Bcm of gas.


The cylindrical Goliat platform

Eni hits production target at Alaska's Nikaitchuq oil field

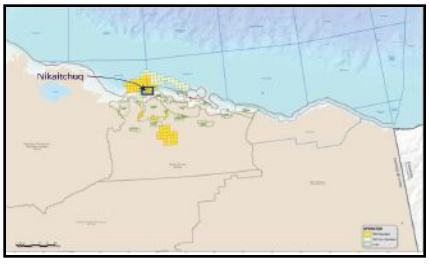

Eni's offshore Nikaitchuq field, situated on Alaska's North Slope with an estimated 200 mmbbl in oil reserves, is the company's first operated in the Arctic

Italy's Eni has achieved the important production goal of 25,000 bbl of oil per day at Alaska's Nikaitchuq field, in which the company is operator with a 100% interest.

The field, located offshore the North Slope a water depth of 3 m, holds reserves estimated at 200 mmbbl of crude oil. Nikaitchuq production, which began in January 2011, is the first operated by Eni in the Arctic.

Development of Nikaitchuq includes the drilling of wells and the construction of facilities both on land and on an artificial island built by Eni in the Beaufort Sea. The location's extreme climate and environmental constraints required the application of Eni's proprietary technologies and expertise to drill multilaterals horizontal wells and to build one of the most advanced production facilities in the North Slope, with maximum environmental compatibility and high operating efficiency.

Nikaitchuq horizontal wells are the most complex wells drilled by the industry to date in Alaska, with a lateral displacement that extends up to 7 km. The field treatment plant is able to handle 40,000 bbl per day of crude oil and up to 120,000 bbl per day of water.



Nikaitchuq production is transported through the Trans-Alaska Pipeline to be sold on the market without the need for further treatment. Eni is now working toward achieving the new production target of 30,000 bbl per day over the next year.

In the United States, Eni owns interests in 200 leases in the Gulf of Mexico and 530 leases in unconventional plays (shale gas and shale oil) onshore Texas. In addition, Eni owns interests in 100 leases in the North Slope of Alaska, which include Nikaitchuq and 30% of the Oooguruk oil field, which has been in production since 2008. Total Eni's daily net production is approximately 100,000 boe (75% operated).

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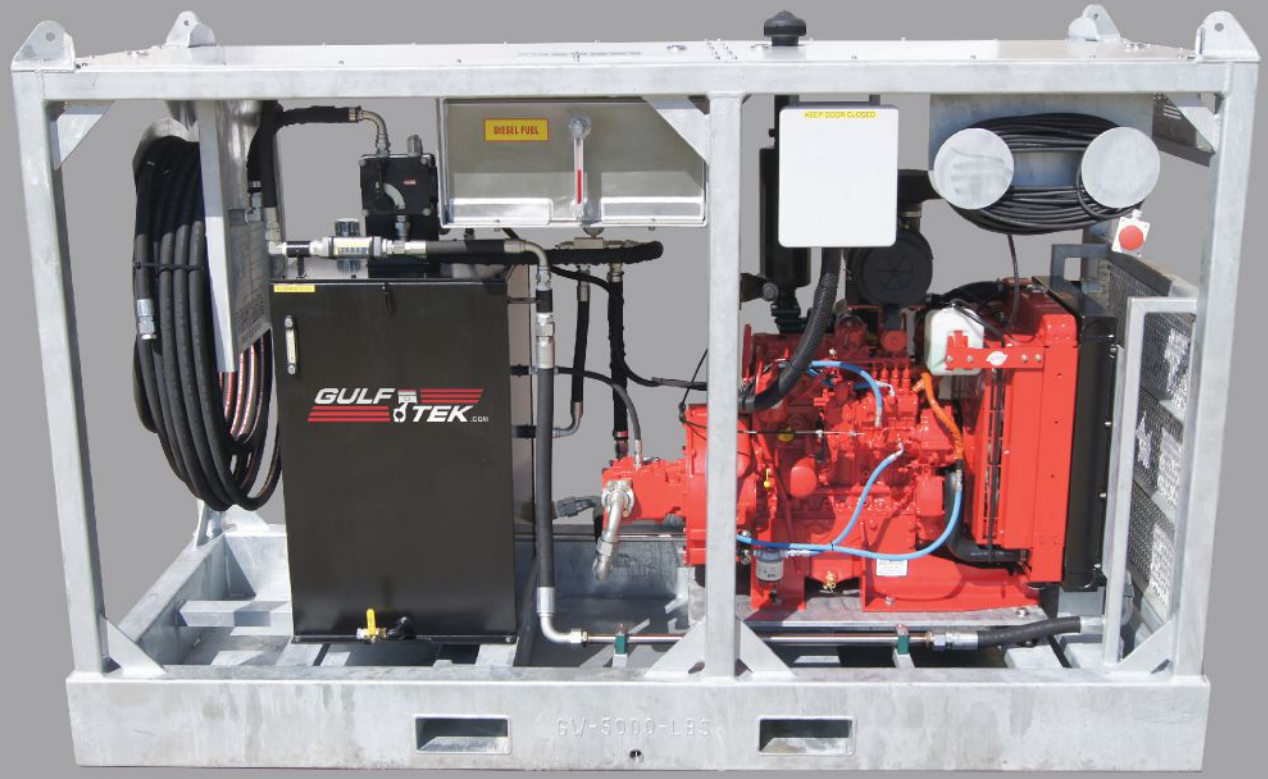

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A refurbished Msheireb jack-up rig.

Occidental takes delivery of latest offshore Qatar jack-up drilling rig

Occidental Petroleum has accepted the jack-up Msheireb for drilling operations offshore Qatar. Gulf Drilling International (GDI) refurbished the rig, which it acquired earlier this year.

It has a 60-ft cantilever outreach and can drill to a depth of 25,000 ft, operate in a water depth of 300 ft, and accommodate 116 persons. It is due to start a 5-year, $237 million contract soon.

Msheireb will be GDI's third rig working for Oxy, with Al Rayyan and Al Wajba already under contract.

KMP to build additional 50,000-ton product tanker for growing fleet

Kinder Morgan Energy Partners, L.P. expanded its contract with General Dynamics NASSCO for the design and construction of an additional 50,000-ton LNG-conversion-ready product tanker with a 330,000-bbl cargo capacity.

Construction is scheduled to begin in the fourth quarter of 2015 with delivery slated for the second quarter of 2017. This new tanker will be constructed as a sister tanker to the four Jones Act tankers KMP currently has under construction at the NASSCO shipyard in San Diego.

"There continues to be increasing demand for waterborne transportation to move petroleum products, and these tankers will provide stable, fee-based cash flow to KMP unitholders for many years to come through multi-year contracts with major oil producers," said Rob Kurz, vice president of Kinder Morgan Terminals and president of KMP subsidiary American Petroleum Tankers (APT).

As previously announced, KMP acquired APT and State Class Tankers for $960 million in cash last January. At that time, KMP purchased five operating vessels and noted it would invest an additional $214 million to complete financing for the construction of four new Jones Act-qualified vessels, which will be delivered between November 2015 and October 2016. Pricing for the additional tanker is consistent with the previously announced transaction.

GustoMSC unveils Magellan-class drillship design for deeper waters

GustoMSC has unveiled its latest deepwater drilling concept, the Magellan-class drillship, which it claims provides improvements in redundancy, autonomy, safety, and load-carrying capacity.

"After the Macondo incident in 2010, for example, there were many recommendations concerning operational procedures and rig design, with an emphasis on safety. We naturally wanted to incorporate that information into the new design," said Sjoerd Hendriks, the project's design manager.

Magellan is the largest drillship that GustoMSC has designed to date. It is equipped to handle 20,000-psi well control systems, including associated high hook loads and setback capacities.

The vessel is said to accommodate higher pressure, high variable loads, mud volumes and setback capacities, and can

The Magellan-class drillship design

incorporate any advanced drilling techniques such as managed pressure drilling and dual gradient systems. It is also capable of drilling wells beyond the current limit of 12,000 ft, the company adds.

Total E&P Angola cancels $250M vessel contract with Aker Solutions

Total Exploration & Production Angola has cancelled a $250 million contract with Aker Solutions for the Skandi Aker deepwater well intervention vessel. The cancellation leaves approximately $150 million of unfulfilled contract to be removed from Aker's orderbook.

The vessel began operations as a well-

Skandi Aker well intervention vessel

intervention vessel in September 2013, when the contract with Total started. Maintenance and repairs on the vessel, which stopped its operations at the end of March, limited its capacity use to 37%.

Aker Oilfield Services will become part of Akastor, an oilfield services investment company, in September 2014. Akastor will be one of two firms formed as part of the announced separation of Aker Solutions.

The company said the entire financial consequences of the termination will be assumed and accounted for by the Akastor group. Aker Solutions provides products, systems and services to the oil and gas industry with around 28,000 employees in about 30 countries.

Angolan shipyard celebrates arrival of mega-FPSO N'Goma

The N'Goma FPSO, following a voyage of 7,331 mi, has berthed at Paenal's 1,608-ft quayside at Port Amboim. The arrival of the vessel from Singapore marks the yard's second mega-FPSO in 8 months.

"Welcoming N'Goma helps to cement Paenal's key position in the oil industry," said Cesar Guerra, the yard's general manager.

Porto Amboim Estaleiros Navais Ltda, known as Paenal yard, is a joint venture among national oil company Sonangol, SBM Offshore, and DSME with holdings of 40%, 30%, and 30%, respectively.

Once the FPSO is completed, operations will begin on the Eni-operated Block 15/06 West Hub offshore Angola by OPS, a joint venture company between Sonangol and SBM Offshore.

"The OPS team is keen to welcome the N'Goma FPSO into the Angolan fleet and to start a fruitful relationship with Eni Angola SpA under the 12-year lease and operate contract," OPS general manager Fabrice Dumortier said.

Total secures drillship for Egina project offshore Nigeria

Total Upstream Nigeria has contracted Seadrill's new ultra-deepwater drillship West Jupiter to work on the Egina project offshore Nigeria. The contract carries a firm period of five years and could be worth $1.1 billion including mobilization costs.

West Jupiter is one of eight sixth-generation drillships under construction for Seadrill and was to be delivered in August from the Samsung Heavy Industries shipyard in Geoje, South Korea.

It will be outfitted to work in up to 10,000 ft of water -- although it is capable of operating in up to 12,000 ft -- and to drill to subsurface depths up to 37,500 ft.

Meanwhile, Odfjell Drilling and BP Angola have agreed on an amendment to a contract for Odfjell's ultra-deepwater semi-submersible Deepsea Stavanger on block 18 offshore Angola. This is in direct continuation of the existing contract and calls for six wells to be drilled over 13 months. Estimated value is $210 million.

Artist rendering of ultra-deepwater drillship Rowan Reliance

ABB to supply power, propulsion systems for carriers

Power and automation technology provider ABB has won a contract to supply electrical power and propulsion systems for the first of 16 Yamal LNG carriers. Said to be part of a project to transport LNG from the Yamal peninsula in northwest Siberia to Asia and Europe, the contract includes options to equip 15 additional vessels.

The Yamal peninsula is located inside the Arctic Circle and locked in ice for most of the year, and a consortium of partners headed by Russian gas producer Novatek have joined the Yamal project to open up gas from the peninsula.

The new 170,000 cu. m LNG carriers, built to ice-breaking capability of ARC 7, will be used to ship the LNG out of Sabetta port. According to ABB, the new building program will be completed by South Korea's Daewoo Shipbuilding and Marine Engineering (DSME). As part of the contract, ABB will supply turbochargers, generators, switchboards, transformers, electric drives, propulsion control and Azipod propulsion units to power the vessels through arctic conditions. The company claims that in order to keep the facility running at full production, LNG vessels should be operational at all times.

Yamal Arctic LNG carrier

Nautronix delivers ASDrill systems for Rowan drillships

Nautronix has successfully delivered the first two NASDrill RS925 and NASeBOP (Emergency BOP Acoustic Control) systems from their current order of four systems for two of Rowan's new ultra-deepwater drillships, the Rowan Relentless and the Rowan Reliance. The total contract value is approximately $10 million.

NASDrill RS925 combines the two most accurate deepwater acoustic positioning technologies -- Short Baseline (SBL) and Long Baseline (LBL) -- to calculate multiple independent position solutions providing reliable, repeatable input to the vessels DP system. with SBL mode providing accuracies of .15% slant range and LBL mode providing accuracies up to 1m RMS independent of water depth.

Nautronix' NASeBOP Control System provides a method of backup control of critical BOP (blowout preventer) functions in the event of failure of primary communication and control. At the heart of the system is Nautronix' ADS² (Acoustic Digital Spread Spectrum) signalling technology. The system achieves a highly reliable communications link from a surface vessel to a subsea isolation device, such as a full BOP, or a simple isolation device that would be used during surface BOP drilling.

Meanwhile, Houston-based Rowan, through one of its subsidiaries, has entered into a t2-year drilling contract for the Rowan Relentless, the fourth and final drillship in Rowan's current construction program. The contract is with Freeport-McMoRan Oil & Gas LLC, a subsidiary of Freeport-McMoRan Copper & Gold Inc., for operations in the U.S. Gulf of Mexico. The contract is expected to commence in the third quarter of 2015 and will add approximately $425 million to Rowan's current contract backlog.

All four drillships are based on a GustoMSC P10,000 hull design, capable of drilling wells to depths of 40,000 ft in water depths up to 12,000 ft. The DP-3 compliant, dynamically positioned drillship will be equipped with retractable thrusters, two readily deployable seven-ram BOP systems, five mud pumps, dual mud systems, and a maximum hook-load capacity of 1,250 tons. All four of the company's ultra-deepwater drillships are now under long-term contracts.

Keppel FELS ships third Super A jack-up to Ensco

Keppel FELS has delivered its third harsh environment ENSCO 120 Series jack-up drilling rig to Ensco. ENSCO 122, built to an enhanced version of the KFELS Super A Class design, is contracted to Nederlandse Aardolie Maatschappij (NAM) to work offshore the Netherlands.

Enhancements to the design include Ensco's patented Canti-Leverage Advantage technology, claimed to offer cost benefits through allowing more wells to be drilled from one location using the enhanced hoisting capacity at the farthest reach of the cantilever. The rig is designed to operate in a variety of environments in water depths up to 400 ft and to drill to depths of up to 40,000 ft for large multi-well platform, ultra-deep gas, and ultra-long reach well programs.

The first two rigs in the series, ENSCO 120 and ENSCO 121, have been operating in the North Sea while the fourth is expected to be delivered in spring 2016.

Bumi Armada contracts Keppel for FPSO conversion

Bumi Armada Berhad subsidiary Armada Kraken has contracted Keppel Shipyard to convert an FPSO for EnQuest's Kraken heavy-oil field development in the UK northern North Sea. This will be a harsh-environment floater, capable of producing 14 degrees API oil over a period of 25 years. It is due for delivery next summer. It will have capacity to process up to 460,000 bbl per day of fluids and 80,000 bbl per day of oil, with water injection capacity of 275,000 bbl per day.

Aramco confirms Red Sea oil find following significant gas discovery

Saudi Aramco said it discovered three oil and two gas fields over the last year. These included the deepwater oil field Al-Haryd in the Red Sea, which followed a significant gas discovery in the Shaur structure the previous year.

Also in 2013, the company executed its first deepwater drillstem test at Duba-1, in the northern Red Sea, in a water depth of 2,127 ft, the company said, noting that results indicated tight reservoirs for potential future development.

As for offshore development programs, the shallow-water Manifa field off eastern Saudi Arabia entered production in April 2013, 3 months ahead of schedule, with output reaching 500,000 bbl per day of oil by July.

By the time it reaches its full potential at the end of 2014, Manifa will have the capacity to produce 900,000 bbl per day of Arabian heavy crude, along with 90 mmcf per day of gas and 65,000 bbl per day of condensate. It will also deliver feedstock to Jubail and Yanbu'.

Development involved construction of 25 mi of causeways, 1.8 mi of bridges, 27 drilling islands, 13 offshore platforms, 15 onshore drill sites, water supply wells,

injection facilities, pipelines, and a 420-mw heat and electricity plant. The man-made islands and the main and lateral causeways were constructed to house shallow-water wells, viewed as a more cost-effective option than offshore rigs.

Aside from being Aramco's first project to combine onshore, offshore, and a causeway in a single project, Manifa established two world records, the company said. One was for drilling the deepest 6⅛-in. hole section to more than 37,000 ft, and the other for deploying a 7-in. liner with a length of more than 18,000 ft to a depth of 26,000 ft.

Construction of the onshore Wasit gas plant is due to be completed this year. The facilities will process 2.66 bcf per day of non-associated offshore Khuff gas from the Arabiyah and Hasbah fields. Along with output from Karan, this will raise the Kingdom's gas processing capacity by around 40%. Under normal conditions, Wasit should supply 1.7 bcf per day of sales gas to the Master Gas System.

OMV and partners discover oil at Hanssen wildcat offshore Norway

OMV (Norge) and its partners have discovered oil at the Hanssen wildcat well offshore Norway. The Hanssen well, located in production license 537, has encountered a 20 to 25 m oil bearing sandstone with good reservoir properties in the main target.

The Hanssen discovery, which was made around 7 km northwest of the 7324/8-1 Wisting Central oil discovery, was tested and showed a maximum production rate of 2,006 bbl per day of oil and 325,000 cu. ft per day of gas. The well also identified hydrocarbon bearing sandstones in the Late Triassic and in the Middle Triassic but in poor reservoirs.

Awarded in the 20th licensing round in 2009, the Hanssen is the third well drilled in production license 537. As operator, OMV has a 25% share in the license and Tullow Oil, Idemitsu and Petro each have a 20% interest, while Statoil holds the remaining 15% stake.

Noble Energy signs deal for 50% stake in 17 BP tracts in U.S. Gulf

Noble Energy, Inc. has reached an agreement with BP Exploration & Production Inc. to acquire 50% of BP's interest in 17 deepwater exploration leases in the Gulf of Mexico. Each of the leases resides in the Atwater Valley protraction area, with Noble Energy acquiring a 50% working interest in 13 leases and an average 26% working interest in four leases.

As part of the transaction, Noble Energy is participating with a 50% working interest in the Bright prospect, which is currently drilling on Atwater Valley Block 362 in a water depth of approximately 5,600 ft. The initial well, targeting multiple Upper and Middle Miocene reservoirs, is anticipated to be drilled to a total depth of 13,500 ft.

The company's total estimated gross unrisked resource range (P75 - P25) for the Bright prospect is 90 to 350 mmboe. In addition to the Bright prospect, there are multiple follow-on exploration opportunities that have been identified on these newly acquired leases.

"The deepwater Gulf of Mexico is one of Noble Energy's core areas. and today we have expanded our opportunity set there through the successful capture of a number of attractive and sizeable prospects," said Susan M. Cunningham, Noble Energy's senior vice president, Gulf of Mexico, West Africa, and Frontier.

"We have multiple opportunities for substantial hydrocarbon discovery in the near-term, with the Katmai prospect results expected by our second quarter earnings call and the Bright prospect anticipated to be at total depth by the end of the third quarter. In addition to our exploration programs, we are also currently drilling a second well at Dantzler as we progress multiple major projects toward first production."

CGG releases data covering 357 blocks from Deux seismic survey

CGG has released the Fast Trax processed data from its Deux multi-client survey covering 357 blocks in the U.S. Gulf of Mexico. The images have been delivered on schedule less than 7 months after completion of the survey.

Deux is the second of a three-survey multi-client program that CGG is conducting in the Garden Banks, Green Canyon, Keathley Canyon, and Walker Ridge areas of the GoM using StagSeis, its next-generation subsalt imaging solution. CGG is currently acquiring Trois, its third StagSeis survey. The location includes several key prospects and multiple discoveries and covers 293 blocks adjacent to IBALT and Deux. Fast Trax data are already available from IBALT, the first of the StagSeis surveys in the program covering 221 blocks, and the fully processed data set for IBALT Area A will be available in August 2014.

"By the end of our three-survey StagSeis program...more than 7,722 sq, mi of next-generation seismic images covering the ultra-deepwaters...will be available to the industry," CGG chief executive Jean-Georges Malcor said.

Repsol reports oil discovery on TSP block off Trinidad and Tobago

Spain's Repsol said it discovered oil with its TB14 well drilled on the TSP block offshore Trinidad and Tobago, upgrading the northern portion of Teak B field. The well is outside the existing Teak field extension, east of the island of Trinidad. It tested at 1,200 bbl per day and is in commercial production. The company estimates 40 mmbbl of oil in place. Repsol and partners expect to complete at least two more wells this year.

Prinos oil platform offshore Greece

Offshore Greece oil fields could produce for 15 years: Energean

Energean Oil & Gas has raised its estimate of recoverable oil at its fields in the Gulf of Kavala offshore northeast Greece by more than 10% to more than 30 mmbbl. According to ERC Equipoise's Competent Persons Report, the main Prinos oil field holds 11.9 mmbbl recoverable, Prinos North has 3.4 mmbbl, while the Epsilon field has 15 mmbbl recoverable.

The upgrade follows an assessment of data obtained from an ongoing study of the three fields; reprocessing of a seismic survey; and information obtained during the drilling of two wells on Prinos that Energean completed during fall 2013.

While Prinos and Prinos North are mature fields, ERC said, there is scope for lifting production through infill drilling and side tracks to target by-passed oil; recompletion and additional perforations of existing wells on undrained sands; optimization of the distribution of lift gas; and optimization of water injection for pressure support and improved reservoir sweep.

Additionally, Energean's phased development plan for Epsilon should lead to more oil production from this field.

"The recoverable reserves (2P) in 2007, when Energean obtained the Prinos licenses, were estimated at just 2 mmbbl of oil and an end to its production seemed both inevitable and immediate," said Mathios Rigas, Energean's chairman and chief executive officer.

"Now, production from the Gulf of Kavala will continue for at least a further 15 years, and we will be announcing the detailed investment program in Kavala shortly, which will safeguard jobs and local economic growth. The continued production at Kavala is the result of a €180 million ($244 million) investment by Energean over the last 7 years, and the dedicated efforts of our technical and operational team."

Alaska producers, others agree to advance LNG engineering studies

ConocoPhillips, BP, ExxonMobil Corp. and other parties have signed an agreement to advance the state's long-sought multibillion-dollar liquefied natural gas project. The signing of the agreement will allow the parties to move toward a permitting phase and to conduct work that will be needed to apply for a license to export the North Slope's massive natural gas reserves.

The new agreement will precede a second phase of work, expected to start in 2016, that will require another agreement and approval from the Legislature. Production wouldn't begin until 2025 or 2026, said Dan Fauske, president of the Alaska Gasline Development Corp.

In addition to the North Slope's largest oil producers, the agreement was also signed by pipeline builder TransCanada and the Alaska Gasline Development Corp.

The $40 to $65 billion Alaska project–calling for a roughly 800-mi pipeline from Alaska's North Slope, as well as a liquefaction facility at Nikiski to super-chill the gas to a liquid so it can be exported in tankers – has not filed for permitting.

Statoil continues to increase gas reserves offshore Tanzania

Statoil has increased its estimate of in-place natural gas in Block 2 offshore Tanzania to 20 tcf following the completion of the Piri-1 discovery well. The new gas discovery was made in the same Lower Cretaceous sandstones as the Zafarani-1 discovery well drilled in 2012. The well location is 1.25 mi southwest of the Lavani-1 well at 7,741 ft of water.

Piri-1 was drilled, by the drillship Discoverer Americas which now has moved to drill the Binzari prospect in Block 2. The Piri-1 discovery is the venture's sixth discovery in Block 2. It was preceded by gas discoveries at Zafarani-1, Lavani-1, Tangawizi-1 and Mronge-1, and a discovery in Lavani-2.

"Additional prospectivity has been mapped and will be tested throughout 2014 and 2015. We expect to drill several additional exploration and appraisal wells and hope that the results from these wells will continue to add gas volumes for a future large-scale gas infrastructure development," said Nick Maden, senior vice president for Statoil's exploration in the Western Hemisphere.

Statoil operates the license on behalf of Tanzania Petroleum Development Corp. and has a 65% working interest. ExxonMobil Exploration and Production Tanzania holds the remaining 35%.

Brazil's Petrobras touts presalt success as oil production rises

Brazil's Petrobras, in the process of reaching a new presalt oil production output record, has reduced the time required to drill wells into the presalt. This combination is expected to continue rising as a percent of Petrobras' total production to 2018. The new production record of 520,000 bbl per day of oil was hit on June 24 from 25 wells. Of this total, 406,000 bbl per day presalt accounts for 274,000 bbl per day while Campos provides 246,000 bbl per day.

In reaching this record, Petrobras said it has reduced the average drilling time per well in the presalt Lula and Sapinhoá fields by 55%, down from 126 days in 2010 to 60 days in 2013. The company equates this to a savings of $66 million per well for the wells that cost about $1 million a day to drill.

In 2013 Petrobras created its Well Cost Reduction Program as part of its 2014-2018 business plan and expects further reductions in its cost per well over that time. The plan calls for spending $70 billion on exploration and development wells over the period.

Looking back at 2013 results, Petrobras said it had a 100% success rate in presalt wells, finding oil in all of the 14 wells drilled in Santos and Campos basins. Counting all offshore wells, the success rate was 77%. From 2010 to 2014, Petrobras presalt production grew from 41,000 bbl per day to the new record level that represents 22% of all its Brazilian production.

Looking ahead, Petrobras expects its presalt production to account for 52% of its total Brazilian production target of 3.2 mmbbl per day by 2018. At that point, plans call for 19 new production units to have been installed in Santos basin presalt alone. By the end of this year, two new FPSOs are scheduled to be in production in the Santos presalt, the Cidade de Mangaratiba in Iracema South and Cidade de Ilhabela in Sapinhoá North. Each is to have a production capacity of 150,000 bbl per day.

Three added FPSOs are scheduled to be operational in 2016: Cidade de Maricá in Lula Alto, Cidade de Saquarema in Lula Central, and Cidade de Caraguatatuba in Lapa.

OGN Group delivers steel jacket for MonArb project

OGN Group has delivered the 6,333-ton steel jacket for Talisman Sinopec Energy UK's MonArb area redevelopment (MAR) project in the UK central North Sea.

The 387-ft tall structure will support the new oil and gas production platform. This will be bridge-linked to the existing Montrose platform that was installed by original operator BP in 1975.

The 6,333-ton MAR steel jacket

During the 18-month construction program OGN employed a team of more than 700. Following completion, the jacket was loaded onto a 492-ft long transportation barge moored alongside OGN Group's Hadrian Yard on the north bank of the River Tyne in northeast England.

On arrival at the field, 130 mi east of Aberdeen, Scotland, the jacket will be installed alongside the existing Montrose platform. The MAR Project will integrate the undeveloped Cayley and Shaw fields with numerous older ones already in production. It is expected to lead to production of an additional 100 mmboe and extend the life of the existing fields to 2030.

Nexans dispatches first of four standard Statoil umbilicals

Nexans has delivered the first of four standard umbilicals ordered by Statoil for subsea tiebacks offshore Norway. The first umbilical will be deployed at the Oseberg Delta field in the North Sea.

All four umbilicals comprise electrical and fiber optic cables as well as hydraulic and chemical lines. The standardized "package solution" should bring savings in time, cost, and materials during execution of the projects, according to Nexans.

In December 2012, Statoil initially ordered static and dynamic umbilicals for Oseberg Delta and Snøhvit in the Barents Sea and Smørbukk South in the Norwegian Sea. Last fall it expanded its order to include umbilicals for the Gullfaks Rimfaks Valley gas field in the North Sea.

In total, the company will provide 31 mi of static and dynamic umbilicals, all manufactured in Halden, Norway.

Arkutun-Dagi field platform in place offshore Sakhalin Island

The Sakhalin-1 partners Rosneft and ExxonMobil have installed the Berkut drilling platform over the Arkutun-Dagi field in the Okhotsk Sea offshore eastern Russia.

Water depth is 115 ft. Plans are for a drilling rig optimized for year-round operations at the far north location to drill 45 wells with a radius of up to 4.3 mi from the platform. Production from the field is expected to start in December.

According to Rosneft, the Berkut platform was designed for work in harsh sub-arctic conditions and to withstand waves up to 59 ft high, ice floe pressure up to 6.6 ft thick, and temperatures down to - 47 degrees.

Sakhalin-1 was the first shelf project approved by the Russian Federation on PSA terms in 1996. The development takes in three fields, with Chaivo and Odoptu already in production. Operations could continue through 2050.

Afren says various projects enter drilling phase offshore Nigeria

Afren said installation had started on the Central Fault Block extension platform on the Ebok field offshore Nigeria. Development drilling was expected to get under way this summer targeting additional reservoirs in the block.

Batch drilling has started from the Ebok West Fault Block platform into the North Fault Block, with production to the existing MOPU. Later this year Afren plans to drill the step-out exploration well Ebok Deep.

Okoro, another offshore Nigeria field, has been averaging 15,648 bbl per day of oil. Afren and its partners have approval from, the Nigerian authorities for the Okoro Further Field development.

The Okwok wellhead jacket has been fabricated and is on its way to the field area. Following installation of the platform, development drilling was expected to start in the third quarter of this year.

The company has completed a 1,048-sq. mi 3D seismic program across its OPL 310 and OML 113 leases to determine the full extent of the syn-rift play and other dip-closed structures north and east of its Ogo discovery. Processing of the data should begin soon.

Off Côte d'Ivoire the company negotiated additional acreage last year in two new blocks, CI-523 and CI-525. It plans an extensive 3D seismic acquisition campaign later in 2014.

North Sea Eldfisk II project enters commissioning phase: Conoco

ConocoPhillips Norway said the Eldfisk II project in the southern Norwegian Sea has entered the commissioning phase following installation of the Eldfisk 2/7 S platform topsides.

Last month, the two topsides modules were transported from Kværner's yard in Stord and lifted into place at the Eldfisk Complex.

At peak, around 550 personnel will be working to complete the platform, connect systems, and prepare for production from new wells during the first quarter of 2015. In parallel, there will be modifications on existing installations at Eldfisk.

KrisEnergy approves Wassana oil development in Gulf of Thailand

KrisEnergy will go ahead with its Wassana oil development in Thailand after approving a final investment decision for the project, the company said. The development is located in the Gulf of Thailand G10/48 license and production is expected to start in the second half of 2015.

The Wassana development concept includes a mobile offshore production unit (MOPU) and 12 to 14 development wells producing to a floating storage offloading vessel. KrisEnergy will use a converted Bethlehem Matt Type jack-up rig, which is due to be delivered in September 2014.

The company owns 100% working stake in G10/48, which covers 4,696 sq. km over the southern section of the Pattani Basin in water depths up to 60 m.

The license includes three oil discoveries—Wassana, Niramai and Mayura—in several stages of development or appraisal. The Wassana oil field is anticipated to reach a peak production of 10,000 bbl per day.

"Having taken over operatorship of G10/48 in mid-May, we are making good headway in advancing the Wassana development," said Chris Gibson-Robinson, KrisEnergy's exploration and production director. "The MOPU solution is efficient both in timing and costs, but also provides flexibility..."

GE Oil & Gas to supply Pemex with equipment for GoM wells

GE Oil & Gas will provide vital surface equipment to Mexico's Pemex for use at its offshore project in the Ayatsil heavy oil field located in the Campeche Sound, in the Gulf of Mexico.

The multi-year contract includes the installation of GE's surface wellheads and trees in new wells that will be drilled by Pemex through the duration of the contract. Pemex is focused on strengthening oil extraction in the Marine Zone, an area located within territorial waters near the coasts of Campeche, Yucatan, and Quintana Roo.

Pemex considers Ayatsil to be one of the fields that will help the company recover the historic production of the zone and continue to increase it in the coming years.

GE's surface wellheads and trees will be manufactured at the company's Ecatepec plant in Mexico City, which has been equipped with new manufacturing hardware.

While the Ayatsil offshore project is GE's largest contract currently underway in the Marine Zone, the company is also working with Pemex on several other initiatives. GE recently announced it is teaming with Pemex and the Mexico Institute of Petroleum to research and develop technologies to help improve productivity and efficiency in mature fields, develop deepwater and ultra-deepwater projects, and modernize Mexico's energy infrastructure.

UK approves Premier Oil's plan for Catcher area in Central North Sea

The UK Department of Energy and Climate Change has approved Premier Oil's development plan for the Catcher oil and gas field area. Located in the UK Central North Sea, the area is estimated to produce 96 mmboe with first oil planned for mid-2017.

The project includes the drilling of 22 subsea wells on the Catcher, Varadero and Burgman fields with a peak production rate of approximately 50,000 bbl per day. Tankers will be used to offload the oil while gas will be exported through the SEGAL facilities.

Premier Oil has already awarded all major service contracts for the project, which is currently in the execution phase. The company operates the Catcher area with a 50% working interest, while Cairn Energy and Hungary's MOL Group own 30% and 20%, respectively.

The Catcher project includes the drilling of 22 subsea wells on the Catcher, Varadero and Burgman fields

"Having discovered Catcher in 2010, we are extremely pleased to have brought the Catcher area through the development approval process," said Simon Lockett, Premier Oil's chief executive officer. Once on-stream, this project, which has been facilitated by the government's small field allowances, will underpin our growing cash flows."

The initial Catcher well, which was drilled in May 2010, found Cromarty reservoir with an estimated net oil pay of 27 m.

Regal Beloit offers rotor motors that help stabilize offshore operations

Regal Beloit believes a new era in offshore working has begun with the launch of its Barge Master platform, an invention of motion-compensation platforms to be used on board flat top barges and supply vessels. The platforms prove a stable base for cargo during vessel-to-platform transfers. They can also be used as a steady foundation for crawler crane lifting operations.

Designed as a low-cost, high-performance alternative to existing offshore and near-shore lifting equipment, such as jack-up barges, Barge Master has an internal hydraulic mechanism that measures seawave and swell conditions and compensates for them so that the platform remains steady. With massive and unrelenting forces involved, a critical part of the system is the hydraulic power pack, which is driven by marine-approved electric motors supplied by Rotor BV, part of Regal Beloit.

Barge Master recently built its first platform with a 700-ton load capacity; the hydraulic pumps of this platform are powered by three 510 kw Rotor electric motors. This Barge Master platform was ready for commercial use from September 2012 onward, with production of more scheduled to follow. The design of each new Barge Master platform can be easily customized to specific requirements, if necessary.

The control system is based on the concept of servo feedback loops. The hydraulic system can measure the beginnings of a sea-induced movement and generate a reverse thrust to compensate for it; the larger the motion, the greater the compensatory reverse thrust.

The Barge Master platform also increases workable conditions, helping to contain cost and allowing deadlines to be met. It reduces dependence on high-cost specialist equipment such as jack-up barges by allowing standard floating barges, vessels, and cranes to be used more widely.

Kvaerner leading Arctic subsea separation and storage study

Kvaerner Canada is leading a new research and development project into adapting subsea separation and storage facilities for harsh Arctic conditions.

The Research & Development Corp. of Newfoundland and Labrador (RDC) and Statoil Canada are providing financial support. This follows Kvaerner's submission last year as part of Statoil's Arctic R&D Step Up initiative and RDC's ArcticTECH, a private sector-led R&D initiative in Newfoundland and Labrador formed to address technological gaps in Arctic and harsh environment oil and gas development.

Kvaerner's program will research concepts involving subsea tanks made from concrete. On the seafloor these will enable separation of gas and water from oil produced from an offshore field and subsequent storage of oil during the production process.

MCA acquires counter-pollution systems to clean up UK oil spills

The Maritime and Coastguard Agency (MCA) has purchased two new pieces of equipment that can be deployed anywhere in the UK to clean up oil spills.

Developed following the Deepwater Horizon oil spill response in 2010, the new high-tech equipment dubbed NOFI Current Buster 6 has been tested for the first time in Belfast and is claimed to be the latest in up-to-date technology. The equipment has a hydrodynamic shape that reduces the drag force and allows the system to move easily through the water with the capacity to operate five times faster.

The new model, which was put to the test in a demonstration in Belfast Lough in June, also has debris nets, wave dampers and a splash-over cover to avoid spillages. With an oily water separator, the system has a temporary storage capacity of 70 sq. m.

"The MCA has a thorough response procedure in place to deal with many different types of emergencies at sea that cause pollution or threaten to cause pollution," said Gail Robertson, MCA counter-pollution resource manager. "Demonstrations like the one in Belfast Harbor show how our equipment is fit for purpose. These two NOFI Current Buster 6 will enhance and boost our response capability around the whole of the UK."

New insulation wraps protect drilling assets by improving hardbanding

Hardbanding has been proven to decrease drilling costs and downtime while increasing profitability and productivity. But if the finished hardband tool joint is allowed to cool too fast, it can seriously damage the structural integrity of the drill pipe or string.

To be sure that hardbanding is properly applied, worldwide hardbanding leader Postle Industries has introduced new protective insulation wraps that decelerate the cooling process immediately following the application of hardbanding.

The new insulator wraps, called Postalloy® HB Insulators, are a key component in ensuring that hardbanding will protect the assets of drilling contractors and rental companies. Postalloy® HB Insulators slow the cooling process on hardbanded tool joints, HWDP and drill collars. If the tool joint cools too rapidly, it results in increased hardness in the area that surrounds the hardbanding. This increase in hardness could lead to failure of the tool joint.

ARKeX launches XField plug-in for Petrel E&P software platform

ARKeX has launched its XField plug-in for the Petrel E&P software platform. XField enables seismic interpreters to analyze and seamlessly integrate potential field data (gravity, magnetic, and gravity gradiometry) alongside seismic data, says ARKeX. Geological models can be generated with more accuracy and confidence than was previously possible, reducing exploration uncertainty, risk, and cost. XField was developed to enable seismic interpreters to use gravity and magnetic data without requiring specialist training. The simple-to-use software is fully certified and integrated into Petrel, providing users with an improved geological understanding through the ability to build better, more comprehensive, de-risked geological models.

Expro deploys new-generation well test string in Gulf of Mexico

International oilfield services company Expro has successfully deployed its new design ExACT™ (Expro Annulus-Operated Circulating and Test Tool) in its first live offshore well.

The operation, a tubing conveyed perforating "shoot and pull," took place on the Vermillion field offshore in the Gulf of Mexico following trial work onshore in Brazil last year.

The tool, one of the most advanced of its kind, according to Expro, combines downhole shut-in and circulating functionality. Rated at 15,000 psi and temperatures of up to 400°F, ExACT features minimal fast-cycling to position the ball and ports in the required position shortening times between cycles and therefore reducing cost.

A key aspect of the tool is its flexible application to fit with a range of downhole operational conditions and objectives. During the deployment, TCP guns were fired using a pressure-activated firing system set to detonate with 2,400 psi applied annulus pressure.

Using a bespoke in-house software program, the ExACT tool was set up at surface to fully function downhole with applied annulus pressure between 1,100 and 1,400 psi, leaving the desired firing head safety margin of 1,000 psi. Post-job analysis of gauge data verified that ExACT was operating within 50 psi of calculated values in all tool positions.

Part of Expro's new generation of drill stem testing tools and developed in-house, the ExACT tool is primarily aimed at the E&A and deepwater markets. Its SmartCollet and interlocking system makes the tool operationally flexible and efficient, ultimately saving rig time, according to the company.

"This deployment is a positive step forward towards an operational launch of our Advanced DST tool offering later this year," said David Grant, Expro's DST/TCP director.

"The ExACT system can be deployed in any well type; however, it is ideally suited for gas wells and deepwater markets. The fast-cycling tool can also provide a very high circulating rate, which is paramount in high cost operations such as those in deepwater applications."

Antelope supplies two HI-FOG fire systems for Shell Malikai

Working closely with GEE Solutions on the ground, Antelope Engineering has delivered another two custom HI-FOG fire system enclosures for the Shell Malikai Project in Malaysia. The systems meet the stringent guidelines set by clients such as Shell, Petronas and Murphy, and a number of them have already gone into the Malaysian oil and gas market.

Antelope is able to take a standard HI-FOG system and modify it for the oil and gas sector without compromising the original tested design that has been approved by both FM and VdS. Applications are as per NFPA750 requirements with twin shot systems, giving the end-user peace of mind.

The systems are designed as per HI-FOG requirements, pre-manufactured in Australia and sent to Malaysia for expert assembly by GEE Solutions onto the generator enclosure prior to it leaving for offshore. The systems are commissioned by experienced factory trained personnel from Antelope Engineering, which involves a full system discharge test under stringent client supervision. This ensures the system is handed over to the client quickly, efficiently and trouble-free.

INDUSTRY DEALS

Stone Energy sells Gulf of Mexico Shelf oil and gas fields for $200M

Stone Energy Corp. said it agreed to sell certain Gulf of Mexico Shelf oil and gas fields to Talos Energy Offshore in a $200 million deal. The Lafayette-based company said the sale will allow it to focus on drilling projects onshore and in deep waters of the Gulf.

According to a release, Talos, a Houston-based oil and gas company active in the Gulf of Mexico, will pay $200 million in cash upfront and assume $117 million in future costs to plug and abandon wells on the properties.

Stone Energy will keep a 50% working interest in the fields as well as the right to drill ultra-deep oil and gas wells in the area.

Stone Energy has slowly whittled down its presence in the shallow waters of the U.S. Gulf as it seeks to channel more money toward projects in the oil-rich deepwater Gulf as well as deep gas wells onshore and projects in the Appalachian region.

The company has sold about $300 million in Gulf of Mexico Shelf properties in recent years, including this most recent sale. Stone Energy's remaining properties on the Gulf of Mexico Shelf are oil-focused, producing about 6,000 boe per day.

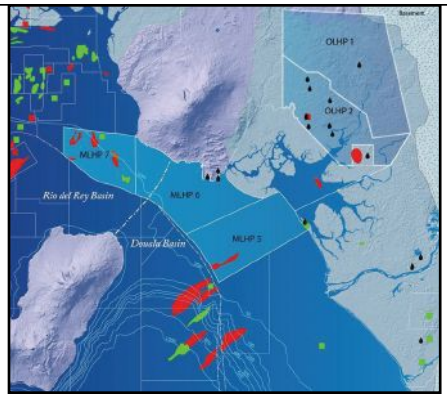
ExxonMobil sells offshore Malaysia interests to EnQuest subsidiary

EnQuest subsidiary EQ Petroleum Production Malaysia has agreed to acquire ExxonMobil's interest in the Seligi oil field and the PM8 production-sharing contract (PSC) offshore Malaysia. The PSC was due to expire at the end of June. EnQuest will pay ExxonMobil $67 million in cash and will enter into a transition services to ensure a smooth transfer of the assets.

Seligi is a 30.9-sq. mi oil field 149 mi off peninsular Malaysia in a water depth of 239 ft. It has been developed via the Seligi-A production platform-gas compression platform complex.

Seven minimum facilities satellite platforms are tied back to Seligi-A. Four of these were installed to develop the Lawang, Langat, Serudon, North Raya, South Raya, and Yong fields in PM8. To date they have produced around 100 mmbbl of oil from the original 180 mmbbl in place.

EnQuest will enter an agreement with Petronas to extend development and production from PM8 and Seligi through 2033.



Bowleven to sell 50% stake in Etinde permit offshore Cameroon

Africa-focused oil and gas exploration firm Bowleven has agreed to sell its 50% stake in the Etinde permit, offshore Cameroon, for $250 million. Russian oil firm Lukoil will buy a 37.5% stake in the field while New Age (African Global Energy) will acquire the remaining 12.5%. The transaction will reduce Bowleven's interest in the permit from 75% to 25%.

Camop, a subsidiary of NewAge, will become the operator of the permit after completion, enabling Bowleven to focus on its exploration skillset. The Etinde permit, which lies in shallow water adjacent to the coast, currently features blocks MLHP-5, MLHP-6 and MLHP-7.

Offshore Cameroon is divided into two hydrocarbon provinces, the Rio Del Rey Basin and the Douala Basin, which were formed following rifting between Africa and South America.

The permit sits across both basins with block MLHP-7 and part of block MLHP-6 within the Rio Del Rey Basin, and block MLHP-5 and the southern part of block MLHP-6 within the Douala Basin.

"With the exploitation authorization approved and nearing formal award, gas sales discussions well advanced and significantly increased scope for expansion to additional gas offtake solutions, in particular CLNG, we believe now is the right time to bring in a new partner and transfer operatorship," Bowleven chief executive Kevin Hart said.

Russia's Rosneft raises $1.5B through selling BP fuel in advance

OAO Rosneft, Russia's largest oil producer, raised at least $1.5 billion through a deal to supply crude oil and fuel to UK's BP. BP will pay in advance for as much as 12 million tons of oil products and crude to be supplied during the next 5 years, starting last month, Rosneft said in a statement.

State-run Rosneft is increasingly using more pre-payment deals to raise funds, a trend that may accelerate as deteriorating relations between Russia, the United States and Europe make it more expensive to borrow in mainstream debt markets. The company's chief executive officer, Igor Sechin, said in February that pre-payments could total more than $100 billion by 2017. Rosneft already has agreements with oil traders Glencore Plc and Vitol Group as well as Chinese customers including China National Petroleum Corp.

A number of unidentified financial institutions are said to have participated in today's deal with BP, Rosneft said without naming the banks. However, several reportedly withdrew contending that doing business with Russian companies was too risky because of U.S. and European Union sanctions against Russia.

BP became Rosneft's largest shareholder after the Russian state last year when it acquired a 19.8% stake as part of a deal to sell its shares in oil explorer TNK-BP.

Italy's Eni to acquire stake in South African offshore exploration permit

Italian energy firm Eni has agreed to acquire a 40% stake and operatorship in exploration right permit 236 (ER236) in South Africa from Sasol Petroleum International.

The permit allows the company to explore for hydrocarbons on an 82,000 sq. km area along South Africa's east coast in the Durban and Zululand basins offshore Kwazulu-Natal province.

The Petroleum Agency of South Africa (PASA) granted the permit to Sasol in November 2013 and the latest agreement is subject to government approval.

Sasol Petroleum International, the upstream oil and gas subsidiary of Sasol, will retain the remaining 60% stake in the permit.

Eni, which already has an exploration presence in Mozambique and Kenya, said the agreement with Sasol signals better cooperation between both the firms in southern Africa.

"The establishment of our partnership with Eni in respect of our offshore South African interests complements Sasol's strategy to develop sustainable energy solutions, which will serve to ensure all-important economic growth and development in southern Africa and the broader region," said David Constable, Sasol's chief executive officer.

"In addition, accelerated exploration activity, as represented by ER236, will have many positive benefits for South Africa and the broader region in terms of energy security and increasing levels of international investment."

ROV success continues for Bibby Offshore Singapore
Award-winning subsea installation contractor, Bibby Offshore Singapore (BOS), recently announced the successful completion of an extensive Inspection, Repair and Maintenance (IRM) project for Brunei Shell Petroleum (BSP) offshore assets. BOS worked closely with sister company Bibby Remote Intervention Limited (BRIL), which was established at the end of 2011 to manage the increased market demand for ROV services. The work scope for this project varied in terms of depth, from seven m to 480 m, with the variety of depth presenting its own challenges to both the ROV's deployed and the vessel, especially when working in shallower waters. The project involved the inspection of BSP's East and West assets and covered a total of 55 pipelines, with a combined length of over 243 km. In addition to the lengths of pipelines, the scope of work involved the inspection of 106 platform risers and two abandoned wellheads (at 460 m and 480 m respectively). ROV's were deployed from the Bibby Spring, ROV support vessel which is fully configured for IRM operations and boasts dual ROV capability. The complex nature of the BSP project required careful consideration of the calibre and functionality of the ROVs utilised. Following an in-depth assessment, the nimble, inspection class Seaeye Lynx 1145 was mobilised to perform the 106 riser inspections, whilst the SMD Atom ROV was utilised as the work class vehicle for pipeline inspection operations due to the system's small footprint. The combination of these ROVs working together was critical to the success of the project.

Ashtead Technology secures distributor agreement for leading sonar imaging technology
Global subsea equipment solutions specialist, Ashtead Technology, has secured an exclusive sales distribution agreement with Sound Metrics Corporation, a leading sonar imaging manufacturer, for the sale of DIDSON and ARIS imaging sonar systems to the oil and gas market in the UK and Singapore regions. The DIDSON and ARIS products are unique ultra high-definition imaging sonar systems, for critical detailed inspection and identification projects. The leading edge systems can be deployed from vessels, ROVs, AUVs and used by divers in various industries including, oil and gas, military, search & rescue, hydro-energy, exploration, dam & bridge construction and maintenance.

Fugro signs multi-year hydrographic survey contract with U.S. government
Fugro is one of eight firms recently awarded a five-year hydrographic survey contract by the National Oceanic and Atmospheric Administration (NOAA). Task orders under this indefinite delivery, indefinite quantity (IDIQ) contract will support development of updated navigational charts in U.S. waters, including Alaska, Hawaii, the Territories and the Great Lakes. With a maximum value of USD 250 million the contracts call for both vesseland aircraft-based hydrographic survey capabilities. "We are honored to continue working with NOAA on its hydrographic charting program," said David Millar, president of Fugro Pelagos. "It is a tremendous responsibility to keep the nation's charts updated given the dynamic nature of our coasts. We take our role in this effort very seriously, dedicating the best possible technology and experienced staff to the task to ensure efficient and accurate results." Fugro has been providing hydrographic survey services to NOAA since 1998.

Phoenix Artemis AUV completes initial operations in search for Malaysia Airlines flight 370
Phoenix International Holdings, Inc. (Phoenix) recently completed side scan sonar search operations for Malaysia Airlines Flight 370 using the company's Artemis AUV. The Phoenix search team returned to port on 31 May for demobilization after conducting TPL and AUV search operations onboard the ADV Ocean Shield for almost 60 days. During the side scan sonar phase of the search effort, the Phoenix Project Team deployed the Artemis AUV to water depths up to 5,005 m of seawater (the deepest depth ever achieved by a Bluefin 21 AUV) to search for Malaysia Airlines Flight 370. Artemis recorded over 370 hrs of in-water time and searched approximately 870 sq. km of the bottom collecting important side scan sonar data.

FMC Technologies receives new ROV orders

FMC Technologies Inc. has received new orders from Delta SubSea (DSS) for HD59 and HD60 ROVs for delivery in July 2014. Its Schilling Robotics business unit entered into a frame agreement with Delta SubSea for the supply of work-class ROV systems in 2013, to supply a fleet of state-of-the-art ROV systems over the next several years.

"We are proud to announce the addition of two Schilling Robotics HD 150 Hp work-class ROVs to our growing fleet," said Scott Dingman, President-CEO of DSS. "These new systems are slated for long term contracts consisting of multiple years with major upstream oil and gas operators for IMR work. We look forward to continuing our business relationship with FMC Schilling Robotics to support our growth in the East Africa, West Africa, and Southeast Asia regions."

FMC Technologies, Inc. also announced that it has received an order from Tidewater Subsea, L.L.C. for two new UHD-III ROVs from its Schilling Robotics business unit. The ROV systems are expected to be delivered in fourth quarter of 2014. Leveraging Tidewater's global footprint, Tidewater will provide complete solutions to a growing customer base in some of the most challenging and remote locations in the world.

The UHD-III system is the latest generation of work-class vehicles, incorporating FMC Technologies' award winning ISOL-8 Pump as a key feature that enables compliance with API Standard 53, which requires a secondary intervention method on blowout preventers (BOPs) to close rams in less than 45-seconds. The UHD-III is the only API 53 compliant ROV available on the market, and it enables secondary BOP intervention at a fraction of the traditional cost.

For more information, visit www.fmctechnologies.com.

Unique System FZE supports significant hydrographic project for Bayanat

A division of Unique Maritime Group (UMG) which is one of the world's leading integrated turnkey subsea and offshore solutions provider, Unique System FZE has recently supported a significant hydrographic project that included the installation of Kongsberg's EM 2040 multibeam echo sounder units for "Bayanat for Mapping & Surveying Services (Bayanat)" in 2 different vessels at Abu Dhabi, UAE.

Bayanat is a wholly-owned Mubadala company that was born from the commercialization of the UAE Armed Forces Military Survey Department (MSD). Bayanat's focus is to

provide both a strategic capability for the UAE and to support our clients in both the government and commercial sectors with high-quality national level geospatial products and services.

The project involved the installation and commissioning of the full systems on board two identical vessels having approximately 12 m by 3.5 m dimensions with powerful engines suitable for maneuvering and keeping straight survey lines. The auxiliary sensors, such as the motion sensor, gyro, GPS unit, etc., fixed on board the vessels helped facilitate the additional information required to carry out the surveys at different project sites.

The stability of the multibeam system and frequency choices (200 to 400 kHz) makes the unit perfect for working in this region. The pitch, roll, and yaw stabilization options available with Kongsberg multibeam systems makes the data more reliable and acceptable. The physical and angular dimensions of the vessel and equipment were measured by a highly experienced land survey team using their sophisticated equipment while the system was dry docked and reports were generated. The vessel draft was measured to be approximately 0.7 m below the waterline, which also helped the system to work in extremely shallow waters.

Commissioning of the vessels was carried out at Esnad Port in Abu Dhabi jointly by Unique and Kongsberg in the presence of the engineering and survey team of Bayanat. The Harbor Acceptance Tests (HATs) and Sea Acceptance Tests (SATs) were carried out at the site, and results were tabulated and verified by the team along with the data processing team at Bayanat. The system was found to be working satisfactorily. As a part of the HAT/SAT system, calibration was also done in order to ensure system performance. The data were verified successfully using Hypack®/Hysweep® software to check the quality of EM 2040 D system on board both vessels.

For more information, visit www.uniquegroup.com.

Another Cougar for wind power

Demand from the offshore wind industry has led Innovatum to add a second Saab Seaeye Cougar XT Compact to its ROV fleet.

This comes as Innovatum's reputation grows in the offshore wind industry for cutting the cost of inshore survey work.

They have achieved this by creating the world's smallest system of compact and rapidly mobilized packages for the location, tracking and survey of inshore and coastal pipelines and cables.

"For survey work close inshore in the strong currents and tidal flows of the southern North Sea, the Cougar's six-strong thruster power is essential," says Innovatum's managing director Terry Slater.

Designed especially for working in shallow waters and in tight situations, the low-profile Cougar XT Compact version minimizes the effect of current with its reduced frame size, buoyancy

and weight–and a thinner 17 mm tether cable that reduces the effect of drag.

Despite its small size, the Cougar XT Compact can be fitted with a wide range of equipment including Innovatum's "SMARTSEARCH" 6-m wide gradiometer array for UXO detection. Despite the use of this very large sensor system the high power to weight ratio still allows a performance comparable with work-class ROVs.

The Innovatum model is also fitted with its own Smartrak system along with a high-resolution imaging sonar and dual-headed scanning profiler for mean seabed level measurement.

Innovatum's Smartrak is the only system in the world that can sense cables carrying either AC or DC current and cables carrying no current or signal at all. It can also undertake passive tracking of steel pipelines.

For survey work the Cougar has the advantage of a low electrical and acoustic noise signature for optimum survey sensor data.

The Innovatum system creates comprehensive reports and charts showing accurate cable route and depth of burial along the route. This data is required by installation contractors, owners and regulatory authorities, to ensure that the cable is properly buried and not in danger of being exposed to damage.

The system can undertake submarine cable surveys in shallow water depths - the typical scenario for offshore wind farms–interconnector power cables and coastal communications cables.

For more information, visit www.seaeye.com.

Ashtead Technology announces subsea 3D modeling agreement

Global subsea equipment solutions specialist, Ashtead Technology has secured a global agreement with U.S. photogrammetry and software firm, DimEye, for the provision of subsea 3D modeling services to the offshore oil and gas industry.

The collaboration will see Ashtead Technology supply high-definition 3D video cameras and Video Laser Scan systems (VLS™), together with data processing services from DimEye, offering customers a full high-accuracy 3D modeling service capable of operating in the most challenging and hazardous environments.

Camera systems can be deployed on ROVs of any size, and typical subsea 3D modeling applications include as-built modeling, damage inspections and spool piece metrology as well as flex joint, valve and hull inspections and mooring chain and line measurement.

The agreement is the latest in a number of alliances with niche product suppliers to further strengthen Ashtead's position as the leading provider of state-of-the-art subsea equipment solutions on both a sale and rental basis.

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

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Advanced MacArtney TRIAXUS ROTV for CSIRO

MacArtney has supplied a TRIAXUS remotely operated towed underwater vehicle to the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia's national science agency.

The TRIAXUS underwater vehicle will be utilised on Australia's Marine National Facility research vessel, the Investigator.

This instrument will be used in a diverse range of oceanographic research activities. Currently fitted with a CTD, laser optical plankton counter, transmissometer, fluorescence and PAR sensors, the TRIAXUS is well suited to many aspects of plankton research; however, utilizing the CTD the TRIAXUS is also intended to be used in investigations of frontal features, air sea interactions and much more.

Currently undergoing the final stages of construction, the highly advanced CSIRO research vessel, Investigator, is bound to provide a significant contribution to Australia's ocean research capacity and deliver increased opportunity for participation in research programs at a global scale.

For more information, visit www.macartney.com.

6G surveying and structure installation for Thien Nam Positioning JSC with Ranger 2

Vietnamese survey company, Thien Nam Positioning JSC, has recently invested in its first Ranger 2 USBL acoustic positioning system from Sonardyne International Ltd., purchased through the company's regional office in Singapore. Ranger 2 will be used to track an ROV during the installation of a pipe flowline and a gas export pipeline protection mattress in an oilfield offshore Vietnam.

Ranger 2 is a high-performance acoustic position reference system designed for tracking underwater targets and positioning dynamically positioned (DP) vessels. The system uses the Ultra-Short BaseLine (USBL) method to calculate the position of a subsea target, in this case Thien Nam's ROV, by measuring the range and bearing from a vessel-mounted transceiver to an acoustic transponder mounted on the target. Multiple subsea targets over a wide area and range of water depths can be simultaneously and precisely positioned.

Subsea structure installation requires accurate and precise positioning. Sonardyne Wideband 2 at the core of 6G technology uses ultra-wide bandwidth signals for more precise ranging, providing the necessary accuracy and precision for these projects. For this operation, transponders will be mounted on the mattress so that Ranger 2 can track it as it descends, ensuring that it is laid within permitted ranges for protecting the pipeline.

For more information, visit www.sonardyne.com.

Benthic expands fleet with PROD4 acquisition

SMD are delighted to have been selected to build Benthic's PROD4 (Portable Remotely Operated Drill). Benthic, a global geosciences company, has announced plans to augment its PROD fleet with the contracted build of PROD4 expected to enter service in Q3 of 2015.

PROD4 will be an enhanced version of the successful PROD2 and PROD3, which recently set seabed drill deepwater records in East Africa. PROD4 is a 3,000-m rated geotechnical drill capable of undertaking CPT measurements, BPT measurement, rock and piston cores to depths up to 150 m below the mud-line. The delivery of PROD4 will bring the fleet to a total of four commercial drill systems worldwide.

PROD4 will be complemented by a fourth Launch & Recovery System (LARS4) featuring Active Heave Compensation and 3,000 m deployment capability. LARS4 has been completely redesigned to provide clients with an enhanced deployment capability in harsh environments, deep and ultra-deepwater conditions and has been configured to be mobilized on a wider range of vessels than was previously possible. Ennsub has been contracted to build LARS4 and expects its completion in Q1 of 2015.

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

Subsea training centre launches work class ROV training course

The world's first training course in work class ROV operations delivered by an independent training provider has been launched by The Underwater Centre in Fort William.

The first intake of students has started on the new five-week course - An Introduction to Work Class ROV Operations - which will change the way industry recruits and trains its staff.

The residential course is taking place at the Centre, which is based on the shores of Loch Linnhe, a tidal sea lake, on Scotland's west coast. Further courses have been scheduled for the rest of the year to cope with the huge demand for ROV operators forecast by the industry.

The training will come under the umbrella of the new ROV Industry Training Academy, which is being established and will be led by a steering group made up of key industry personnel who will ensure the training closely reflects the needs of the industry. This will include basic training introducing technical personnel to the industry and, in due course, more advanced training designed to accelerate ROV personnel through their careers. It will be delivered in a contextual training environment, ensuring it is as realistic as possible to the conditions that are found offshore.

The syllabus for the course includes ROV industry familiarization, electrical and electronic systems, a two-day high voltage awareness course, an introduction to hydraulics, working at height training, ROV operations, including pre and post-dive checks, launch and recovery operations, piloting an observation class ROV and Triton XL26 in an operational environment, and an introduction to ROV maintenance, including electrical retermination of armored umbilical and tether.

For more information, visit www.theunderwatercentre.com.

SeaBotix vLBV in air-deployed MCM exercise

The SeaBotix vLBV300 ROV was recently part of a groundbreaking MCM test exercise put on by Explosive Ordnance Disposal Training and Evaluation Unit One (EODTEU ONE) in San Diego. Two small combat rubber

raiding craft (CRRC) containing the vLBV and an AUV were launched from a C-130 Aircraft via parachute to the ocean off Southern California and followed by a contingent of U.S. Navy EOD technicians.

Once a suspicious object was located with the AUV, target data was uploaded to the SeaBotix vLBV control console and then the vLBV was piloted to the target for positive identification. The target was confirmed at ~54 m (175 FSW) in less than three hours, significantly reducing the typical time required for the same operation done traditionally, while reducing the number of personnel required.

For more information, visit www.SeaBotix.com.

Earth station boosts maritime broadband with iDirect Evolution upgrade
VT iDirect, Inc., a company of Vision Technologies Systems, Inc. (VT Systems), announced that UK-based independent teleport operator Cobbett Hill Earth Station is upgrading the network of its maritime services unit, ION (International Ocean Services) to the iDirect Evolution 3.2 Platform. The acquisition of maritime satellite communications provider ION in 2013 marked Cobbett Hill Earth Station's expansion into the commercial maritime market, which according to NSR will hold close to 1 million in-service units by 2023. This will be the first in a series of technology investments that Cobbett Hill Earth Station has planned for ION. iDirect is a world leader in satellite-based IP communications technology. Once all ION networks are upgraded to iDirect Evolution 3.2 customers will now experience improved performance on both the outbound channel through ACM and the inbound channel through Adaptive TDMA. Overall, increased bandwidth optimization will boost the power of its maritime broadband services. Once the upgrade is complete across all ION networks, the company plans to implement the iDirect X7 Satellite Router. Cobbett Hill Earth Station is strategically located in Guildford, UK, just 30 min from Central London. The teleport has been located in Guildford since 1996 and operates numerous antennas on geostationary satellites located from 65° East to 57° West, providing data, voice and broadcast services.

Imtech Marine USA renews VSAT connectivity contract
Leading Canadian shipping company Algoma Central Corporation has renewed and upgraded its VSAT Connectivity contract with technology solutions provider Imtech Marine. The agreement now provides VSAT satellite coverage and airtime Connectivity to 34 vessels that are owned or managed by Algoma. Algoma Central Corporation owns and operates the largest Canadian flag fleet of dry and liquid bulk carriers operating on the Great Lakes - St. Lawrence Waterway, including 18 self-unloading dry-bulk carriers, seven gearless dry bulk carriers, and seven product tankers. Algoma also has interests in ocean dry-bulk and product tanker vessels operating in international markets. Algoma provides ship management services for other ship owners and owns a diversified ship repair and steel fabricating facility active in the Great Lakes and St. Lawrence regions of Canada. For the past 6 years the shipping company had a VSAT Connectivity package together with two other Great Lakes operators, American Steamship Company and CSL. But Algoma decided that it would like an independent VSAT Connectivity package. The 3-year renewal includes the iDirect Ku Band Global VSAT Service (6 MB) and two Voice Over IP (VOIP) lines.

KVH Crewtoo named most popular maritime website
Crewtoo, the seafarer social network operated by KVH Industries, Inc., has been named the most popular maritime website in a survey of mariners conducted recently by Futurenautics, an independent information resource that identifies technology trends in the shipping industry. The Crew Communications Survey 2014 addresses many topics surrounding the issue of crew access to the Internet for staying in touch with family and friends. When respondents (nearly 3,000 mariners from 30 different nationalities) were asked to name their favorite maritime website, the single most popular choice was Crewtoo. With 105,000 members, Crewtoo is the world's largest online network dedicated to seafarers, and was founded less than 2 years ago. The online network gives seafarers a way to post comments and photographs from their vessels, chat with colleagues on other ships, take part in seafarer-related polls and votes, and keep up with maritime news. Crewtoo recently added an online maritime jobs board to help match the right companies with the best seafarers. KVH Media Group produces a wide range of news and entertainment content for the maritime industry with brands that include NEWSlink – daily news from around the world, in print or video; MOVIElink – new-release movies from Hollywood and other international studios; TVlink – popular shows and series from leading studios worldwide; SPORTSlink – highlights of games and teams around the world; and MUSIClink – an array of digital music.

Intelsat, SpeedCast join forces

Intelsat S.A. has established a strategic agreement with SpeedCast under which Intelsat will provide SpeedCast access to Intelsat's global C-band and Ku-band satellite capacity as well as to its terrestrially managed network, IntelsatOneSM. The agreement will also provide SpeedCast access to Intelsat's global broadband mobility network, which is comprized of 13 customized Ku-band mobility beams on 10 satellites spread around the geostationary belt.

SpeedCast will leverage Intelsat's satellites and terrestrial network to deliver enhanced broadband and mobility solutions to the maritime, oil & gas and enterprise markets with expanded coverage and greater flexibility.

"This new strategic arrangement between SpeedCast and Intelsat is another exciting step in the transformation of SpeedCast into a major global player in the satellite communications markets, on land and at sea," said Pierre-Jean Beylier, chief executive officer, SpeedCast. "Intelsat's global C-and Ku-band network will further enhance our ability to deliver reliable, cost-effective and fast connectivity to our customers."

"Broadband mobility represents one of the fastest growing markets for satellite services," stated Stephen Spengler, president and chief commercial officer, Intelsat. "The new and enhanced agreement with SpeedCast provides both companies with a strong platform to further expand our ability to serve customers. Our partnership with SpeedCast will further strengthen our collective ability to deliver the reliable and efficient broadband and mobile connectivity that today's global businesses demand and need."

For more information, visit www.intelsat.com.

Technip expands services with MTN

Technip has awarded MTN Communications a new contract that will service a substantial portion of its global fleet with critical, high-availability broadband communications. MTN has delivered communications to Technip for the past 10 years and this enhanced contract more than doubles the number of Technip vessels MTN is serving. Based on a collaborative relationship, service excellence and innovative technology, MTN will now provide enhanced value and innovative solutions to fleet vessels in North and South America, Europe, Africa and Southeast Asia.

Technip is expanding its relationship with MTN due to the

data-intensive nature of its business. MTN services are ideal for supporting the extended time periods Technip vessels are at sea. MTN owns and operates a fully redundant global network providing unmatched communications and content services. MTN's reliability, innovation and responsiveness were key to expanding the partnership.

Technip has access to live event streaming from vessels if clients need to view progress on a project or if headquarters needs visibility of an emergency situation. For work/life balance, the Group utilizes MTN satellite services to provide online connectivity–traditional voice, Internet and video services such as live global TV service–in accommodation cabins, as well as common areas.

For more information, visit www.mtnsat.com.

Gilat's low-profile maritime terminals deployed

Gilat Satellite Networks Ltd. has provided its low-profile maritime terminals for various naval vessels of an unnamed Asian country.

The terminals, capable of operating in the harsh maritime environment, provide secure Command-and-Control communications in combat operations. The terminals have been deployed on various vessels, such as missile boats and fast attack craft, in both Ka- and Ku-band variants. Using satellite communication, naval commanders have access to real-time information and better situation awareness, even in the most distant theaters of action.

Gilat's maritime solution is based on the RaySat SR200M and ER5000KA Ka-Band antennas, which provide high-speed connectivity, in a small, light and low-profile form factor. The terminal includes a Wavestream BUC and the GLT-1000 high-performance modem. This tightly integrated terminal has a very small footprint, and can be easily installed even in small and unmanned surface vessels (USV), where size, weight and power (SWaP) limitations are most challenging.

The RaySat low-profile antennas also include an enhanced accuracy satellite tracking mechanism, providing short initial acquisition and instantaneous re-acquisition time. Its innovative, low-profile design provides better safety, smaller radar cross-section and improved maneuverability for military forces.

For more information, visit www.gilat.com.

Iridium's GMDSS application receives support

Iridium Communications Inc. announced that its application to the International Maritime Organization (IMO) for the provision of mobile satellite communications in the Global Maritime Distress and Safety System (GMDSS) was reviewed by the IMO Sub-Committee on Navigation, Communications and Search and Rescue (NCSR). The application will now proceed to the Maritime Safety Committee (MSC) at its next meeting in November, before advancing to a group of experts for comprehensive technical and operational evaluation.

Overwhelmingly, the delegates stated support for the United States position to advance Iridium's application to the next stage for evaluation. Final approval will be up to the Maritime Safety

Committee, following review of the experts' report by NCSR, which is expected by mid-2016.

"This is a victory for Iridium and the maritime industry," said Matt Desch, CEO, Iridium. "The overwhelming support for our application to provide the industry an alternative and equally capable option for GMDSS services is a testament to the value and benefit the Iridium® network can provide to maritime safety." This is particularly important for coverage of Polar regions, where the incumbent GMDSS provider is not able to provide service.

Iridium's constellation of 66 low-Earth orbit, inter-connected satellites operates as a fully-meshed network and provides robust and reliable coverage everywhere on Earth–including Polar regions–where demand for reliable voice and data communications is on the rise as shipping and trade routes continue to expand into these remote waters.

Iridium will begin deploying its second generation constellation (Iridium NEXT) in 2015, offering greater capacity, bandwidth and data speeds, as well as backwards compatibility for existing products and services in the market.

In anticipation of IMO recognition, Iridium is working with established maritime communications equipment manufacturers for the production and certification of GMDSS terminals that use the Iridium network, along with Maritime Rescue Coordination Centers and service providers for the provision of maritime safety communications. Once approved, the shipboard terminals will meet both the GMDSS and operational communications needs of a vessel, giving the industry the option of a single, affordable communications terminal to satisfy both safety and business communications wherever they operate. Expected to be available before the end of 2015, GMDSS terminals using the Iridium network are designed to have an operational longevity of nearly 20 years, eliminating the need for vessel owners and operators to purchase new equipment every few years.

For more information, visit www.iridium.com.

Airbus launches SkyFile Mail Manager for maritime

Airbus Defence and Space has launched SkyFile Mail Manager, the latest innovative addition to its leading SkyFile messaging portfolio. Designed to improve management of SkyFile Mail traffic and user accounts, SkyFile Mail Manager, as the latest value added service to work on the Aurora Global network, is a powerful, new online tool that provides IT management efficiency on board and ashore.

The new tool provides detailed reporting and control of all accounts, and features flexible user rights and ship/fleet grouping options, which makes it easier and efficient to manage email traffic. And it introduces a wealth of new functionality in an easy-to-use single, powerful application. With this feature-rich new tool, users can check required account information such as call logs and view vessel activity all from the same place.

IT managers can easily ensure that the master is using the most cost-efficient terminal for mail traffic and further cost savings can be enjoyed through the innovative Quarantine function that ensures unwanted messages are filtered by the system and stored on the SkyFile server. These can either be deleted or pushed to the vessel if needed.

SkyFile Mail Manager's grouping function provides an easy way to configure and monitor a group of ships or fleets. Templates can be applied to one or more fleets, one or more vessels or one or more mail accounts. For example, users can set specific mailbox filters that are then automatically applied to one or more vessels.

Account information is easy to access online at any time and from anywhere. IT managers based onshore can view all account settings and traffic, in addition to sub-accounts by category (MyMail/prepaid, private, corporate) or emails in the waiting list.

The new SkyFile Mail Manager tool is the latest innovation under the new AuroraGlobal initiative of Airbus Defence and Space, launched in the first quarter of this year. With AuroraGlobal the company provides a unique global multi-band network, offering the full choice of satcom-enabled solutions on Ku-, Ka-, C-, L- and X-band. Value added services such as SkyFile Mail and Mail Manager are seamlessly integrated into the AuroraGlobal network, complementing shipping companies' needs for sophisticated messaging and administrations applications.

For more information, visit www.airbusdefenceandspace.com.

iSeaglobal provides 25 Mbps for yachting season on the Mediterranean

iSeaglobal announced a new upgraded ku-band network to supply up to 25 Mbps speed in the Mediterranean. This service, especially tailored to provide Internet access on mega yachts, is designed on a five satellite constellation that allows an ideal back-up on the MED area.

Flexible to any kind of antenna, from 60 to 120 cm, iSeaglobal offers internet, voice and TV services to the maritime industry since 2005.

High-quality Internet connection and multimedia content delivery on mega yachts have become one of the main requirements for yacht owners. Today, most yachts require high-speed, flexible, reliable, efficient and continuous connectivity for the owners, guests and crew. iSeaglobal is capable of delivering all this and more as the service is operated from its own Global Network of Teleports.

"Thanks to our long-term knowledge and experience, we are able to assist any customer in finding the best communications solution that suits the yacht's needs. The flexibility of the Milano Teleport contract terms, the possibility to upgrade or downgrade the bandwidth and in particular to reconsider the coverage during the same agreement, make our solution a unique opportunity for our customers," said Nicola Mossino, sales director and member of the board.

For more information, visit www.milanoteleport.com.

Kongsburg provides technologies for Algerian VTIMS

A consortium comprized of Ericsson, Indjaz, Korea Trading and Industries Co. Ltd and Kongsberg Norcontrol IT will deliver the Algerian national Vessel Traffic Management and Information System (VTIMS).

Kongsberg Norcontrol IT has been selected to provide the core maritime surveillance, voice communications, port management and port community technologies. The VTIMS will facilitate economic growth and the integration of maritime transportation of goods and passengers via Algerian ports.

The Kongsberg Norcontrol IT technologies will provide surveillance across the entire Algerian coastline with a Command and Control structure consisting of:

- Control centers at 11 local ports;
- Regional control centers; and
- National control center.

The Algerian VTMIS aims to improve the safety and security of maritime traffic to, from and within Algerian ports by tracking vessels and facilitating movements, as well as by providing early warnings of potential collisions and groundings. The system also increases efficiency and cooperation between government agencies and maritime companies as well as improved capabilities for search and rescue services.

The VTMIS will enable economic growth and further integration for Algeria as it facilitates maritime transport of goods and passengers from and to Algerian ports and makes Algerian ports compliant with international maritime traffic and security regulations (IALA, IMO, ISPS).

The Port Security system will be provided by Ericsson and provides ubiquitous video surveillance with access control, intrusion detection, perimeter protection, passengers and goods control.

A world-class training program, led by Korea Trading and Industries Co. Ltd, will be delivered through the combined expertise of the consortium and assisted by specialized training institutions.

For more information, visit www.kongsberg.com.

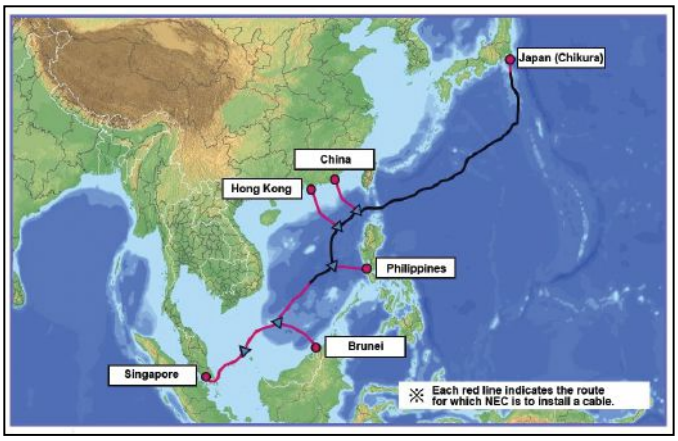
VSMC awarded export cable installation contract
Cabling specialist VSMC, a joint VolkerWessels and Boskalis company, has been awarded a contract by EPC contractor Van Oord Offshore Wind Projects to install and bury a 25-km long export cable for the Eneco Luchterduinen Offshore Wind Farm. The Eneco Luchterduinen Offshore Wind Farm, to be built by Eneco and Mitsubishi Corporation, will be situated in the North Sea, 23 km off the coast, between Noordwijk and Zandvoort, the Netherlands. With 43 wind turbines in total, Luchterduinen will provide up to 150,000 Dutch homes with green energy. The project will be executed in September of this year using the in-house developed burial tool, the Trenchformer, and the newly built cable-laying vessel, the Ndurance; designed for both shallow and deep water operations.

Xtera wins government contract for new cable
Xtera Communications, Inc. was awarded a $31,220,394 firm-fixed-price contract by the U.S. Defense Information Systems Agency for the delivery of a submarine fiber optic cable. In announcing the contract, the U.S. Department of Defense said that it has an 18-month base period and five 1-year option periods. Work will be performed in the Southern Command area of responsibility, with an estimated completion date of December 2015. The solicitation was issued as a competitive, total small business set-aside, and eight offers were received. Defense Working Capital Funds in the amount of $31,220,394 are being obligated at award. The Defense Information Technology Contracting Organization-National Capital Region is the contracting activity. While the announcement did not specify the route, the Miami Herald reports that it will connect Florida with the U.S. Navy base at Guantanamo Bay, Cuba.

NKT Cables' order for Project Gemini confirmed
As announced previously, NKT Cables is involved in the offshore wind farm Project Gemini developed by Typhoon Offshore B.V. and owned by a consortium of investors. The consortium has now confirmed that the project has reached financial close. With this, NKT Cables has now received a binding order worth approximately 165 million euros for the delivery of more than 200 km of 220 kV high-voltage submarine cables and related accessories, all to be manufactured in Cologne, Germany. The cables are to be delivered ready for installation starting early 2015 to the EPC contractor for the Gemini project, Van Oord. Additionally, NKT Cables received the order for supply of the land cable portion of this project, consisting of 5 km of 380 kV cables and around 30 km of 220 kV, to complete the wind farms' connection to the Dutch onshore high-voltage grid. Project Gemini consists of the Buitengaats and ZeeEnergie wind farms to be situated in the Dutch zone of the North Sea, 55 km northeast of the island of Schiermonnikoog, and will have a capacity of 600 MW. With 150 turbines, the wind farms will produce electricity for more than 1.5 million inhabitants. Gemini represents NKT Cables' 10th offshore wind farm project since 2010 when the submarine cable factory in Cologne first started the production of submarine cables.

JDR announces new Brazilian facility
JDR is increasing its global footprint with the opening of a new service and maintenance facility in Brazil. The JDR facility will be the latest addition to the port city of Macaé when it opens for business in third quarter of 2014. The city is seen as an ideal location to build the company's local presence and reputation, with more than 80% of the oil produced by Brazil being linked through the port in some way. JDR specializes in the design and production of steel and thermoplastic subsea production umbilicals, subsea power cables and Intervention Workover Control Systems (IWOCS) as well as offering offshore and field services for the global oil and gas industry. The Brazilian market is seen by JDR as being critical to the globalization of the business, which commands a 70% market share in IWOCS in all markets outside of the South American country.

TE SubCom, SJC Consortium to upgrade SJC



TE SubCom, a TE Connectivity Ltd. company, and the SJC Consortium announced that SubCom, the supplier that will perform the upgrade for SJC, has begun implementation of a network upgrade to the Southeast Asia-Japan Cable (SJC) submarine cable system. The upgrade to the 8,986-km system brings an increase of 6.5 Tbps of capacity utilizing 100 Gbps transmission equipment to meet the constant growing bandwidth demand in the Asia Pacific region.

"An upgrade of this significance confirms the capacity growth Southeast Asia is experiencing," said Qian Zhong, managing director, Asia Pacific sales, TE SubCom. "Equipped with a 6.5 Tbps increase, the SJC upgrade will set a new benchmark in global data and information connectivity by transforming the way businesses and consumers in the region use bandwidth-intensive programs."

"We completed the full system construction project in 2013 and are very excited to see it, and our relationship with the SJC consortium, continue to grow," said John Mitchell, president, TE SubCom. "The Asia Pacific region continues to see a dramatic increase in demand for capacity. TE SubCom is committed to providing the essential bandwidth to enable the region to reliably and affordably interact and communicate with the rest of the world."

Designed to meet bandwidth-intensive applications such as internet TV, online games and enterprise data exchange, the SJC cable system began service in June 2013 and is operated by a global consortium of telecommunications and technology companies, linking the seven countries or territories of Brunei, mainland China, Hong Kong, Japan, Singapore and the Philippines, including the option to connect with Thailand.

The SJC consortium is composed of Brunei International Gateway Sendirian Berhad (BIG), China Mobile International Ltd. (CMI), China Telecommunications Corporation (China Telecom), China Telecom Global Limited (CTG), Donghwa Telecom Co. Ltd (DHT) (a subsidiary of Chunghwa Telecom, Co., Ltd.), Globe Telecom, Inc., Google, KDDI Corporation, Singapore Telecommunications Limited (SingTel), PT Telekomunikasi Indonesia International (Telin a subsidiary of PT. Telekomunikasi Indonesia, Tbk), and TOT Public Co., Ltd. (TOT).

For more information, visit www.subcom.com.

6 Alpha Associates awarded 10-year deal by Tennet

6 Alpha Associates, the strategic advisor for managing high-risk offshore initiatives, has signed a long-term framework contract with TenneT, the European grid operator responsible for connecting offshore wind projects to the German electricity network. The agreement will see 6 Alpha Associates provide complex survey and risk management advice for unexploded ordnance (UXO) risk in the marine environment, working work with TenneT on over 30 new grid connections over the next 10 years.

As offshore wind and cabling projects begin to proliferate in European waters, a legacy of unexploded WWII sea mines, munitions dumps and former military testing sites poses a significant threat, both to the successful and timely delivery of these developments and to the safety of the workers and contractors operating offshore.

In light of costly UXO-related delays on a number of high-profile offshore wind projects across Europe, there is a clear and growing need for project developers and investors not only to come to terms with the nature of this risk but also to manage them in a timely, efficient and cost-effective manner.

The agreement will not only see 6 Alpha assess UXO risks for all of TenneT's on-going cable installation projects but the company will also develop pragmatic risk mitigation measures, including designing UXO-specific geophysical surveys along key cable transmission routes and ensuring that they are accompanied by UXO sign-off certificates, warranting that prospective risks have been reduced to As Low As Reasonably Practicable (ALARP).

For more information, visit www.6alpha.com.

MMT wins cable protection survey contracts

MMT has been awarded the SK4 and NorNed protection survey contract by Statnett, Norway. The contract is divided into two separate projects and include detailed high-resolution offshore ROV surveys and cable tracking. MMT has also been contracted for a geophysical and geotechnical survey of a cable corridor in Gandsfjorden, Norway.

This year's survey campaign for Statnett was granted to MMT. The aim of the offshore survey is to provide Statnett with a Terrain Model (DTM) of the cable and associated trench and berms (where present), as well as a DTM of all engineered crossings including all installed protection. The survey will also provide the location and depth of burial of the cable. The SK4 cable protection survey is performed for both Statnett and Energinet.dk.

MMT has previously performed detailed pre-lay survey for the SK4 cable and have a comprehensive knowledge of the conditions in order to achieve an efficient and safe survey for Statnett.

The cable tracking operations will be conducted from the DP2 vessel Stril Explorer using the WROV Supporter mounted with a TSS. The survey will begin with the SK4 cable tracking operation from approximately 10 m water depth offshore Denmark to the Norwegian landfall at Kvivika. The ROV will be fitted with a multibeam echosounder, side-scan sonar and a TSS cable tracker and a high-definition video system.

Following the SK4 operation the NorNed cable will be surveyed on

Statnett's ownership of the NorNed cable. The survey will provide location and depth of burial of the cable, identify and analyze any exposed, freespanning and shallow burial sections of cable, identify possible damage, locate debris and produce a bathymetric and cable burial difference model from existing survey data.

An additional separate survey for a possible future cable corridor will also be performed by MMT. This survey takes place in Gandsfjorden (Stavanger, Norway) and the purpose is to find suitable routes for up to 10 single core cables. This survey also includes geological sampling; the samples will be collected by a 3-m long gravity corer.

For more information, visit www.mmtab.se.

Energinet.dk prepares for replacement of Konti Skan cable

This summer, Danish power company Energinet.dk will replace one of the three power cables in the Konti Skan connection between Jutland and Læsø. The preparations are well under way.

The horizontal directional drilling on Læsø, through which the new cable must be pulled, has been completed. Before Easter, Energinet.dk also completed the horizontal directional drilling on Jutland. The Korean cable will arrive at the end of July. However, the preparatory work had be completed by 1 May when the season for bird conservation began.

The new cable replaces the oldest of the three cables constituting the Konti Skan connection between Denmark and Sweden. Due to strongly varied operation and the age of the cable, small cracks have formed in the lead sheath around the cable. After half a generation of electricity supply, the 48-year-old cable has served its time.

The routing of the almost 24-km long submarine cable has posed a challenge, as there is a bubble reef on the routing across the Kattegat. Bubble reefs are submarine landscapes of sandstone formations and as the natural habitat is unique for the northern parts of the Kattegat, the EU Commission has added bubble reefs to the list of natural habitats to be preserved.

The cable route will be longer than initially planned, as it is necessary to lead the new submarine cable south of the bubble reef in order not to collide with the preserved natural habitat. This is the only way to minimize the impact on the rare reef.

The laying and trenching of the new submarine cable will begin at the

end of July. The submarine cable will be laid by a cable-laying vessel and pulled through an HDD pipe. The new cable will be commissioned in the autumn of 2014. Once the new submarine cable is in operation, the old cable will be removed.

For more information, visit www.energinet.dk.

Oceanwind awarded cable storage contract

OceanWind, a joint venture between Oceanteam Shipping ASA in Norway and WIND BV, has been awarded a long-term contract to supply Prysmian Powerlink SRL with storage of submarine power cables and additional preparation services.

At its cable facilities in Velsen Noord, the Netherlands, OceanWind will execute the cable handling and provide cable handling equipment. The cables will be stored at one of OceanWind's internal warehouses.

OceanWind facilitates the submarine cable industry by offering its clients a full and integrated range of services comprising cable storage, cable handling, and cable transport. Its cable facility is situated immediately behind the North Sea locks of IJmuiden, in direct proximity of Amsterdam. The equipment utilized for the project is supplied by Oceanteam's 100% owned subsidiary, RentOcean.

For more information, visit www.oceanwind.nl.

Tata, Huawei and Huawei Marine complete 400G trial

Tata Communications, Huawei and Huawei Marine announced the successful completion of a 400G field trial on a subsea network over 6,000 km. The test results demonstrated an optical transmission of 400G signals, an industry first for a submarine fiber optic cable system of this length.

Huawei and Huawei Marine's technical solution adopted the modulation format of Dual Carrier Polarisation Division Multiplexing Quadrature Phase Shift Keying (DC-PDM-QPSK), an innovative Faster-Than-Nyquist (FTN) compensation and recovery algorithm, proprietary clock recovery technology and Soft Decision Forward Error Correction (SD-FEC) technology to address the problems of high-speed signal distortion and unstable clocks. The use of such advanced technology underpins Huawei and Huawei Marine's significant commitment to investing in research and development to meet the needs of their customers.

Tata Communications, Huawei and Huawei Marine continue to advance the boundaries of next-generation transmission technology. The successful 400G field trial over a long-haul system has demonstrated that advanced subsea transmission technology continues to address the future needs of their customers.

For more information, visit www.tatacommunications.com.

Nextgen, INPEX and Shell partner to serve offshore gas project

INPEX and Shell have announced plans to invest in a significant new project to construct a submarine fiber optic cable system with the Nextgen Group delivering critical infrastructure for the nation's resources industry.

The system will provide the INPEX Ichthys Liquefied Natural Gas (LNG) and Shell Prelude Floating Liquefied Natural Gas (FLNG) projects located in the Browse Basin off North West Australia with access to high-speed data and voice communication services for the life of their operations. Work will commence in May 2014 and is scheduled for completion in 2016.

The Prelude and Ichthys projects will contribute equally to the construction of the system, which the Nextgen Group will build, own and operate. The system will stretch approximately 2,000 km between Darwin and Port Hedland.

The subsea fiber optic cable system will provide superior reliability and quality when compared to other available communications solutions such as satellite links. The system will provide an initial design capacity of 3.2 Tbps and has the potential to scale well beyond that as technology matures.

Alcatel-Lucent has been selected by Nextgen Group to supply the submarine fiber optic cable system between Darwin and Port Hedland.

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

Hibernia Networks upgrades transatlantic link with Ciena

Hibernia Networks recently selected Ciena® to provide advanced optical solutions on the Hibernia Networks platform. The first element of Hibernia's network to utilize Ciena's technology will be Hibernia's Trans-Atlantic system. As part of the new relationship with Ciena, Hibernia has also joined Ciena's BizConnect partner program, offering a comprehensive go-to-market strategy that includes joint marketing, training and technical support to penetrate new customers and industries in North America and Europe.

Hibernia Networks is a diverse high-bandwidth connectivity provider with a rich suite of services including IP transit, CDN, carrier Ethernet, Spectrum and others. Its network provides service to global investment banks, content delivery networks (CDN), broadcasters, cloud services, enterprises, international PTTs and ISPs. Hibernia also provides low-latency routes to 31 different financial exchanges around the globe through its Global Financial Network (GFN).

Hibernia will deploy Ciena's GeoMesh submarine solution, including the 6500 Packet-Optical Platform, WaveLogic coherent optics and full ROADM. Together, these components lay the foundation for an OPn® network architecture that will enable Hibernia to scale and react quickly to address changing trans-Atlantic traffic patterns.

Hibernia will also leverage Ciena's OneConnect Intelligent Control Plane platform, which provides seamless end-to-end service provisioning and creation. This added level of control will allow Hibernia to rapidly offer services, all with simple and efficient back-end workflows.

For more information, visit www.hibernianetworks.com.

Columbus partners with Ocean Networks

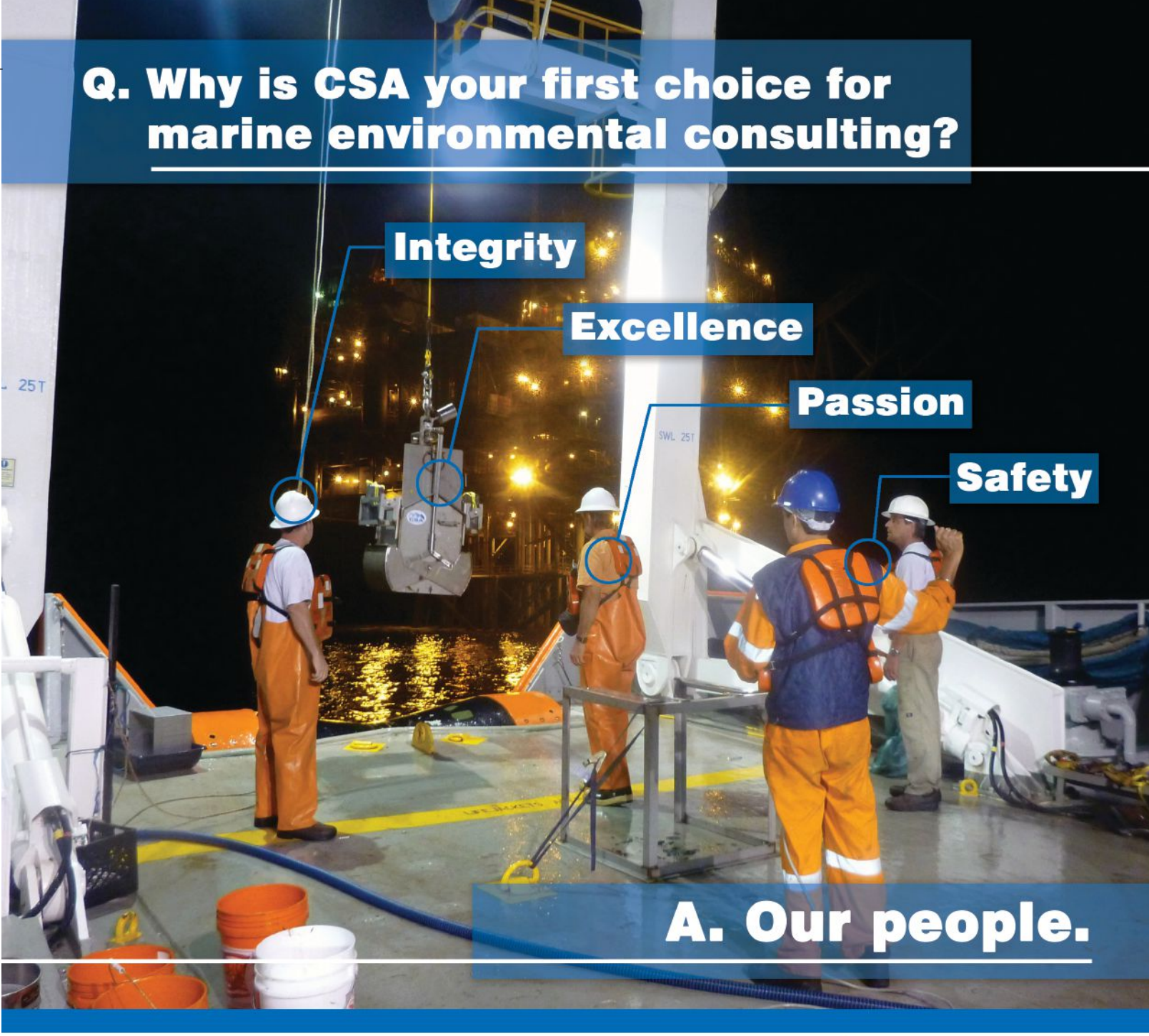
Columbus International Inc. and Ocean Networks Inc. announced that the companies have signed a Letter of Intent (LOI) for a Landing Party Agreement for a Panama submarine cable station and related network services.

Ocean Networks is the owner and developer of the South America Pacific Link (SAPL) submarine cable system. The company's planned 9,700 km trans-Pacific cable interconnects Balboa, Panama to Oahu, Hawaii. Under terms of the partnership, Columbus Networks, working through the recently formed alliance company with Cable & Wireless, CNL-CWC Networks, Inc., will design and construct a carrier class cable station to house the SAPL system and provide network operations and management (NOC and NMA) services.

In addition, Columbus and Ocean Networks have agreed to include additional commercial agreements for onward connectivity from this link to the NAP of Americas and the Caribbean region, using a variety of the diverse subsea network routes.

The South America Pacific Link system will fulfill a requirement for the markets of Central and South America for connectivity to the Asia Pacific region, Australia and New Zealand, via interconnections with existing and planned submarine cable systems. The SAPL system, which is planned for completion in mid-2016, will also provide a cost-effective, direct low-latency route to Hawaii and open a previously untapped transpacific market.

For more information, visit www.columbus-networks.com.



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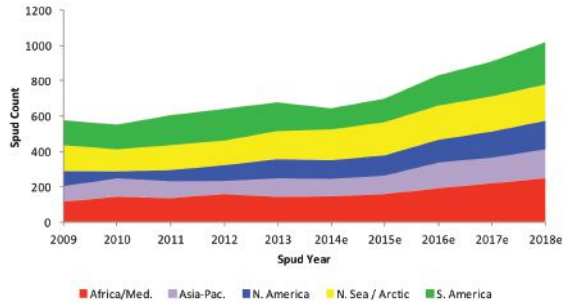
OFFSHORE STATS & DATA

Offshore At-A-Glance

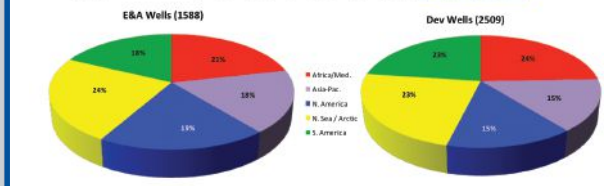
Quest Offshore Activity Report

Global Total Well Demand History and Forecast 2009-2018e (Base Case 7,150 spuds)



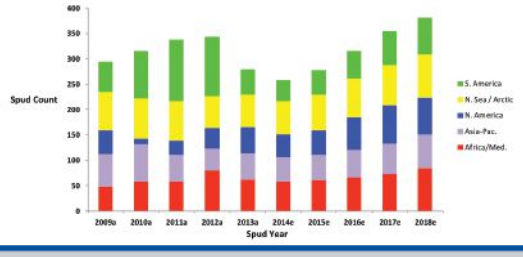
Global Total Well Demand Forecast Only 2014e-2018e (Base Case 4,097 wells)

Total Well Demand	2014e	2015e	2016e	2017e	2018e	Total E&A	Total Dev
Africa/Med.	143	157	189	218	246	341	612
Asia-Pac.	98	103	145	144	163	279	374
N. America	108	117	131	150	164	306	364
N. Sea / Arctic	176	189	194	199	205	378	585
S. America	119	133	171	197	238	284	574
Global	644	699	830	908	1016	1588	2509

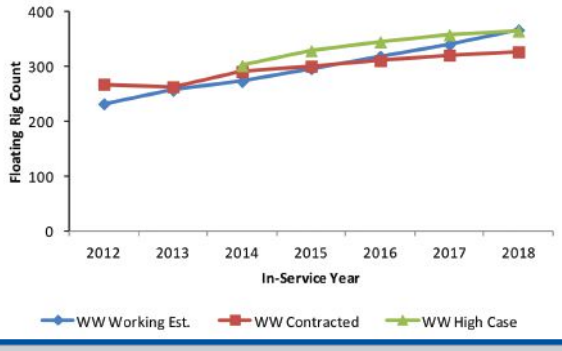


Global Exploration & Appraisal Drilling 2009a-2018e (3,159 spuds)

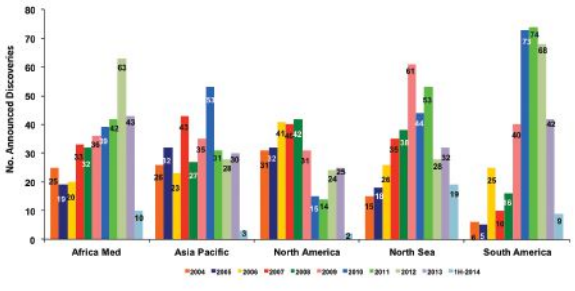
GLOBAL	2009a	2010a	2011a	2012a	2013a	2014e	2015e	2016e	2017e	2018e
Africa/Med.	47	57	57	80	61	58	60	66	73	84
Asia-Pac.	65	75	54	43	52	48	50	54	60	67
N. America	47	11	28	41	52	45	49	64	75	73
N. Sea / Arctic	76	79	77	63	64	66	70	77	80	85
S. America	69	94	122	116	50	43	49	55	67	72
WW	295	316	338	343	279	258	278	316	355	381



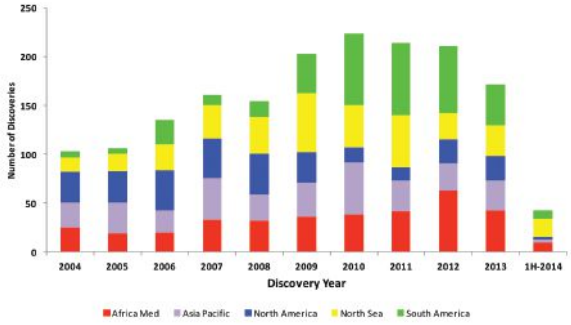
Global Rig Supply 2012-2018



Discoveries by Hemisphere 2004-1H-2014 (1727)



Discoveries by Year Announced 2004-1H-2014 (1727)



FOR MORE DETAILED INFORMATION
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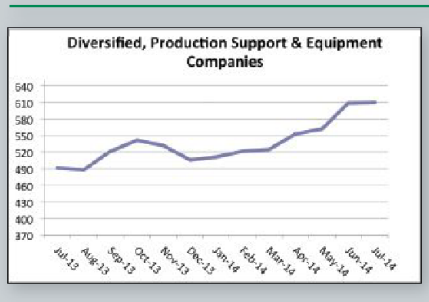
www.QuestOffshore.com • www.SubseaZone.com • www.FloatingProductionZone.com

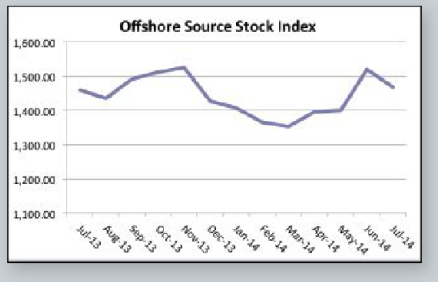
Monthly Stock Figures & Composite Index

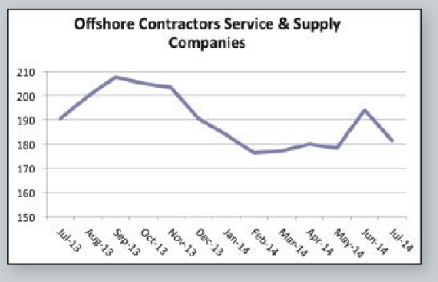
Industry Company Name	Symbol	Close(*Mid*) *July*	Close(*Mid*) *June*	Change	Change %	High 52 week	Low 52 week
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	72.98	74.40	-1.42	-1.9%	74.64	46.09
Cameron Intl. Corp.	CAM	68.62	67.22	1.40	2.1%	69.33	52.50
Drill-Quip, Inc.	DRQ	104.47	106.53	-2.06	-1.9%	121.07	89.97
Halliburton Company	HAL	70.40	69.91	0.49	0.7%	71.46	43.64
Tenaris SA	TS	45.52	46.50	-0.98	-2.1%	49.87	40.63
Newpark Resources, Inc.	NR	11.76	12.17	-0.41	-3.4%	13.64	10.43
Schlumberger Ltd.	SLB	114.74	109.28	5.46	5.0%	118.76	76.76
Superior Energy Services, Inc.	SPN	36.35	36.78	-0.43	-1.2%	36.96	22.85
Weatherford International, Inc.	WFT	22.50	23.06	-0.56	-2.4%	23.25	13.07
Deep Down, Inc.	DPDW	1.81	1.75	0.06	3.4%	2.70	1.44
FMC Technologies	FTI	60.81	60.83	(0.02)	0.0%	62.43	47.58
Total Diversified, Production, Support and Equipment.....		**609.96**	**608.43**	**1.53**	**0.3%**	**644.11**	**444.96**
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	27.54	30.56	-3.02	-9.9%	40.86	25.47
Mitcham Industries, Inc.	MIND	13.33	14.36	-1.03	-7.2%	18.13	12.89
Compagnie Gnrale de Gophysique-Veritas	CGV	11.61	14.77	-3.16	4.50%	25.85	11.51
Total Geophysical / Reservoir Management..…….....		**52.48**	**59.69**	**-7.21**	**-12.1%**	**84.84**	**49.87**
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	50.23	53.42	-3.19	-6.0%	59.49	44.88
Diamond Offshore Drilling, Inc.	DO	48.98	50.54	-1.56	-3.1%	73.00	43.69
ENSCO International, Inc.	ESV	54.23	55.19	-0.96	-1.7%	62.25	47.85
Nabors Industries, Inc.	NBR	28.89	28.47	0.42	1.5%	30.24	14.62
Noble Drilling Corp.	NE	32.75	34.52	-1.77	-5.1%	41.60	28.67
Parker Drilling Company	PKD	6.41	7.01	-0.60	-8.6%	8.67	5.17
Rowan Companies, Inc.	RDC	31.81	32.68	-0.87	-2.7%	38.65	29.50
Transocean Offshore, Inc.	RIG	44.01	45.61	-1.60	-3.5%	55.74	38.47
Total Offshore Drilling..…….....		**297.31**	**307.44**	**-10.13**	**-3.3%**	**369.64**	**252.85**
Offshore Contractors, Services, and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	24.32	26.37	-2.05	-7.8%	27.58	19.44
Gulf Island Frabrication	GIFI	19.91	21.57	-1.66	-7.7%	26.82	18.06
McDermott International, Inc.	MDR	7.54	8.25	-0.71	-8.6%	9.36	6.58
Oceaneering International	OII	73.55	76.95	-3.40	-4.4%	87.64	66.00
Subsea 7 SA	SUBCY.PK	17.68	20.29	-2.61	-12.9%	22.32	17.07
Technip ADS	TKPPY.PK	26.03	27.27	-1.24	-4.5%	31.32	21.08
Tetra Technologies, Inc.	TTI	11.11	11.90	-0.79	-6.6%	13.43	9.41
Cal Dive International, Inc.	DVR	1.30	1.47	-0.17	-11.6%	2.38	1.21
Total Offshore Contractors, Service, and Support..…….....		**181.44**	**194.07**	**-12.63**	**-6.5%**	**220.85**	**158.85**
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	79.00	83.33	-4.33	-5.2%	99.00	77.51
Gulfmark Offshore, Inc.	GLF	43.40	45.57	-2.17	-4.8%	53.89	39.31
Bristow Group	BRS	74.08	79.57	-5.49	-6.9%	85.70	64.10
PHI, Inc.	PHII	38.41	39.88	-1.47	-3.7%	42.70	33.50
Tidewater, Inc.	TDW	50.28	56.24	-5.96	-10.6%	63.22	45.51
Trico Marine Services, Inc.	TRMAQ.PK	0.04	0.04	0.00	0.0%	0.11	0.01
Hornbeck Offshore	HOS	42.19	45.42	-3.23	-7.1%	59.93	37.44
Total Offshore Transportation and Boat .…….....		**327.40**	**350.05**	**-22.65**	**-6.5%**	**404.55**	**297.38**

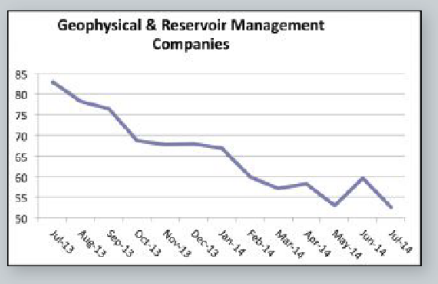
Monthly Stock Figures & Composite Index

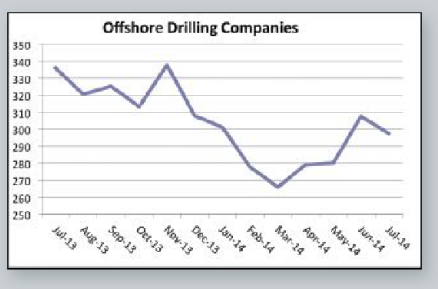
Industry	Close(*Mid*) *July*	Close(*Mid*) *June*	Change	Change %	High 52 week	Low 52 week
Total Diversified, Production, Support and Equipment	**609.96**	**608.43**	**1.53**	**0.3%**	**644.11**	**444.96**
Total Geophysical / Reservoir Management	**52.48**	**59.69**	**-7.21**	**-12.1%**	**84.84**	**49.87**
Total Offshore Drilling	**297.31**	**307.44**	**-10.13**	**-3.3%**	**369.64**	**252.85**
Total Offshore Contractors, Service and Support	**181.44**	**194.07**	**-12.63**	**-6.5%**	**220.85**	**158.85**
Total Offshore Transportation and Boat	**327.40**	**350.05**	**-22.65**	**-6.5%**	**404.55**	**297.38**
Total Offshore Source Index	**1,468.59**	**1,519.68**	**-51.09**	**-3.4%**	**1,723.99**	**1,203.91**

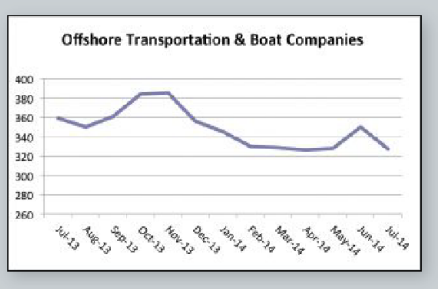










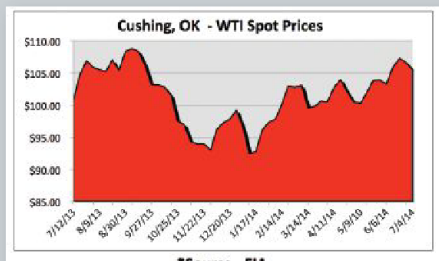


DISCLAIMER

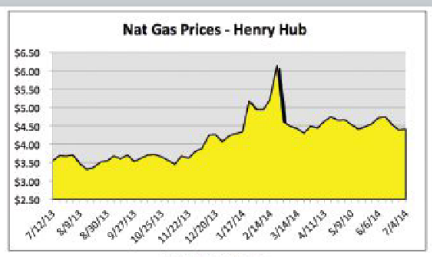
The information on this page is provided for information and comparison purposes only and should not be used to make financial and business decisions and is accurate to the best of our knowledge for the period indicated.

Oil & Gas Industry Trends

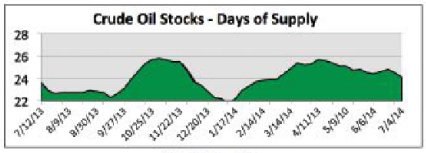
Monitoring the Pulse of the U.S. Offshore Oil & Gas Industry



*Source - EIA



* NYMEX Close



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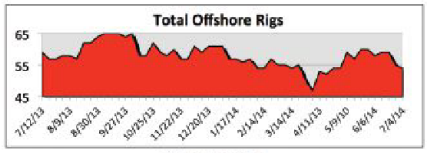
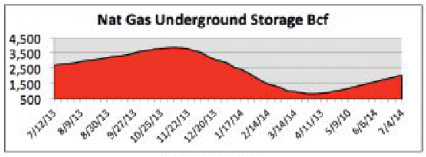
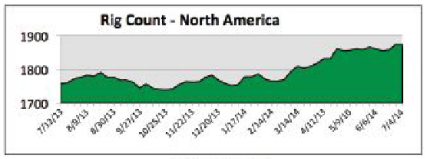


*Baker Hughes



*Source - EIA

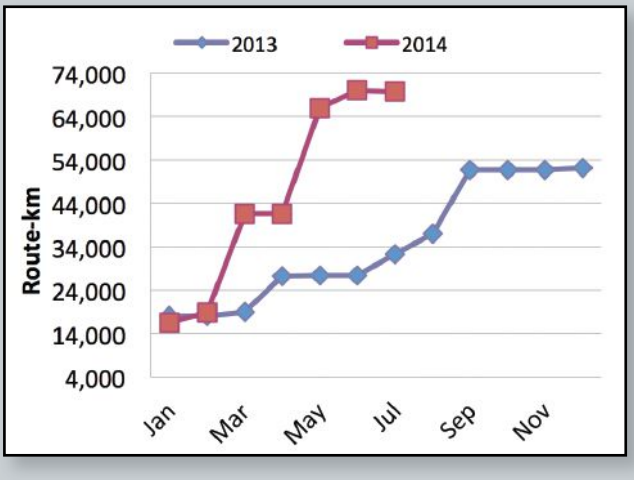


*Baker Hughes

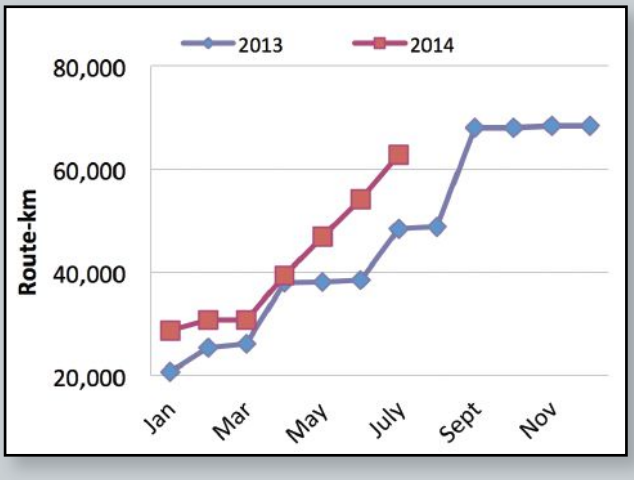
Positive trend, at least 3 weeks
Changing trend, less than 3 weeks
Negative trend, at least 3 weeks

Subsea Telecom & Power Cable Data

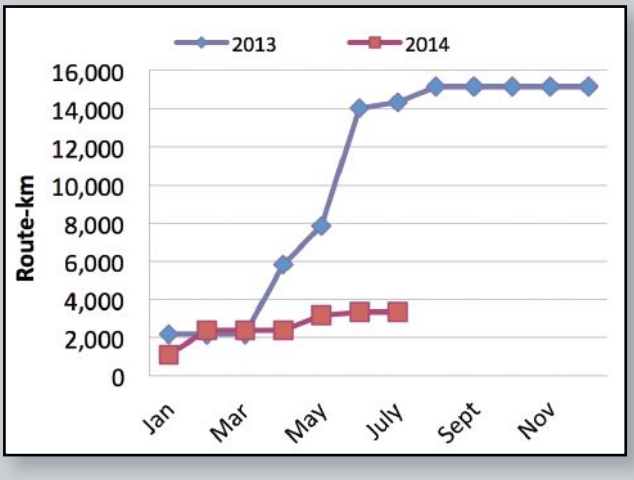
FO Cable Awards by Month



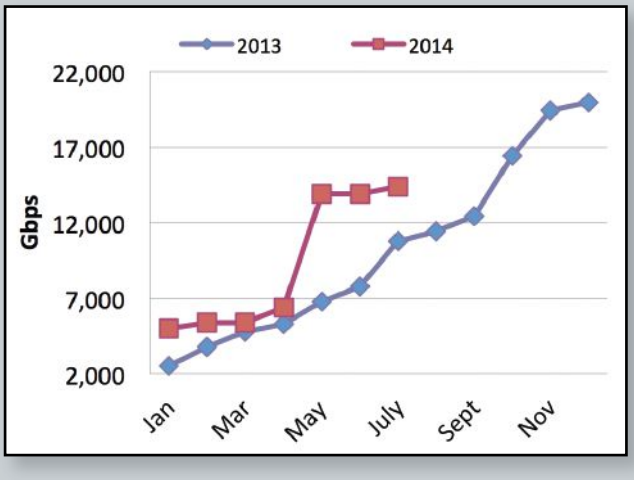
FO Cable Announcements



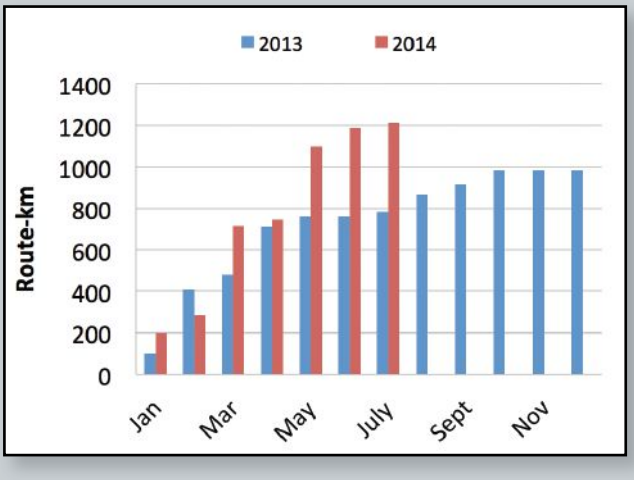
Submarine FO Cables Entering Service in Route-km



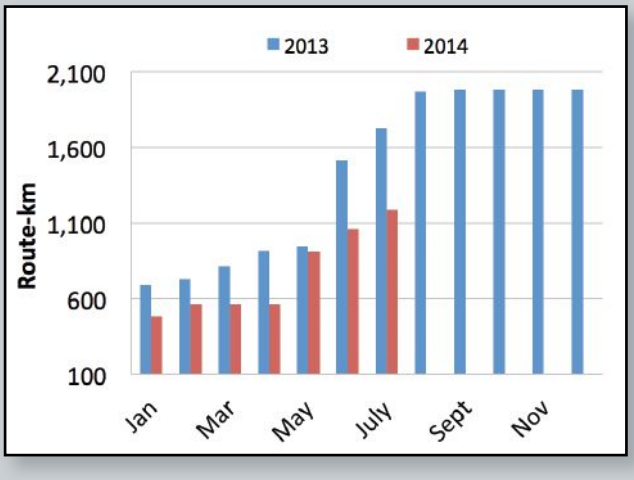
Upgrades of Existing Cable Systems in Gbps



Submarine Power Cable Awards in Route-km



Submarine Power Cable Announcements in Route-km



Gulf of Mexico Data
Current Deepwater Activity

Operator	Area	Block	OCS Lease	Rig Name	Prospect Name	Water Depth (ft)
Eni US Operating Co. Inc.	LL	411	G31847	T.O. DEEPWATER PATHFINDER		9,808
Shell Offshore Inc.	WR	508	G17001	NOBLE JIM DAY	Stones	9,556
Anadarko Petroleum Corp.	LL	399	G23480	CAL-DIVE Q-4000	Independence Hub	8,960
Freeport-McMoRan Oil & Gas LLC	KC	627	G27740	T.O. DEEPWATER CHAMPION	Bonanza	8,746
Shell Offshore Inc.	AC	857	G17561	H&P 205	Great White	7,824
Shell Offshore Inc	MC	525	G31507	NOBLE GLOBETROTTER		7,456
ExxonMobil Corp.	WR	584	G20351	MAERSK VIKING	Julia	7,138
Anadarko Petroleum Corp.	KC	875	G26771	ENSCO 8500	Lucius	6,822
BP Exploration & Production, Inc.	MC	608	G09838	ENSCO DS-3	Anstey	6,623
Apache Deepwater LLC	AT	426	G18603	HARKLAND SPEARFISH	Bass lite	6,617
Noble Energy, Inc.	MC	782	G33757	ATWOOD ADVANTAGE	Caterpillar	6,565
Murphy Exploration & Production Co.	DC	178	G25850	T.O. DISCOVERER DEEP SEAS		6,560
Chevron USA, Inc.	KC	829	G25814	T.O. DISCOVERER CLEAR LEADER	Buckskin	6,428
Repsol E&P USA Inc.	KC	642	G33335	ENSCO DS-5		6,124
BP Exploration & Production, Inc.	MC	778	G14658	THUNDER HORSE PDQ	Thunder Horse North	6,036
Anadarko Petroleum Corp.	WR	52	G25232	DIAMOND OCEAN BLACKHAWK	Shenandoah	5,874
Shell Offshore, Inc.	WR	95	G25234	STENA ICEMAX	Yucatan North	5,860
BP Exploration & Production, Inc.	MC	775	G09866	SEADRILL WEST CAPRICORN	Thunder Horse North	5,673
BP Exploration & Production, Inc.	MC	776	G09866	SEADRILL WEST VELA	Thunder Horse North	5,638
BP Exploration & Production, Inc.	MC	778	G09868	T.O. DISCOVERER ENTERPRISE	Thunder Horse North	5,631
Eni US Operating Co. Inc.	MC	773	G19996	NABORS POOL 140	Devil's Tower	5,610
BP Exploration & Production, Inc.	AT	362	G34584	ENSCO DS-4		5,586
BP Exploration & Production, Inc.	GC	743	G15607	T.O. DEVELOPMENT DRILLER III	Atlantis	5,414
Anadarko Petroleum Corp.	GC	903	G24194	ENSCO 8506	Heidelberg	5,271
Chevron USA, Inc.	GC	807	G31752	PACIFIC SANTA ANA	GC 807 (Anchor Well)	5,230
Anadarko Petroleum Corp.	GC	680	G22987	NOBLE BOB DOUGLAS	Constitution	5,071
Anadarko Petroleum Corp.	GC	680	G21811	BLAKE 1007	Constitution	4,968
Hess Corp.	MC	726	G24101	STENA FORTH	Tubular Bells	4,570
Anadarko Petroleum Corp.	GC	683	G18421	ENSCO 8505	Caesar	4,487
Shell Offshore, Inc.	MC	812	G34461	NOBLE DANNY ADKINS		4,471
BP Exploration & Production Inc.	GC	627	G25174	SEADRILL WEST SIRIUS		4,416
Freeport-McMoRan Oil & Gas LLC	GC	645	G18423	HOLSTEIN SPAR RIG	Holstein	4,344
BHP Billiton Petroleum (GOM) Inc.	GC	653	G20084	GSF C.R. LUIGS	Shenzi development	4,238
Anadarko Petroleum Corp.	GC	562	G11075	WIRELINE UNIT (HOUMA #3)	K-2	4,017
Anadarko Petroleum Corp.	GC	562	G11075	T.O. DISCOVERER SPIRIT	K-2	4,017
Chevron USA, Inc.	KC	10	G27698	T.O. DISCOVERER INDIA		3,965
LLOG Exploration Offshore, LLC	MC	79	G27259	SEADRILL SEVAN LOUISIANA	Humphrey	3,868
Shell Offshore, Inc.	MC	809	G09873	NOBLE DON TAYLOR	Princess	3,853
Shell Offshore, Inc.	MC	934	G07976	ATWOOD CONDOR	Europa	3,849
Shell Offshore, Inc.	MC	809	G12166	H&P 204	Princess	3,800
Shell Offshore, Inc.	GC	248	G15565	T.O. DEEPWATER NAUTILUS	Glider	3,233
Shell Offshore, Inc.	VK	956	G06896	WIRELINE UNIT (N.O. DIST)	Ram-Powell	3,214
Shell Offshore, Inc.	GC	158	G07995	H&P 202	Brutus	2,985
Shell Offshore, Inc.	MC	807	G07963	H&P 201	Mars (Ursa/Princess)	2,945
Statoil Gulf of Mexico LLC	MC	718	G34456	MAERSK DEVELOPER	Juno	2,918
Chevron USA, Inc.	GC	205	G05911	NABORS 85 (MAYRONNE 162)	Genesis	2,590
Anadarko Petroleum Corp.	VK	869	G13065	WIRELINE UNIT (N.O. #2)	Nile	2,423
Stone Energy Corp.	MC	29	G13997	ENSCO 8502	Cardona	2,121
Noble Energy Inc.	GC	40	G34536	ENSCO 8501		2,079
Anadarko Petroleum Corp.	VK	869	G13065	HELIX 534	Nile	2,033
Marubeni Oil & Gas (USA) Inc.	GC	113	G15546	NOBLE DRILLER	Angus	1,968
SandRidge Offshore, LLC	GC	65	G05889	H&P 206	Bullwinkle	1,353
Walter Oil & Gas Corp.	EW	913	G16575	DP SEMI RIG TO BE DETERMINED		685

Deepwater prospects with drilling and workover activity: 53

Current Deepwater Activity as of Monday, 7 July 2014

Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,511	35,591	2,489
201 to 400	116	1,120	20
401 to 800	232	873	10
801 to 1,000	362	582	9
1,000 & above	3,330	1,936	26

Rig Activity Report 11 July 2014

Location	Week of 7/11	+/-	Week Ago	+/-	Year Ago
Land	1801	-1	1802	+121	1680
Inland Waters	18	0	18	-4	22
Offshore	56	+2	54	-1	57
U.S. Total	1875	+1	1874	+116	1759
Gulf of Mexico	55	+2	53	0	55
Canada	315	+6	309	+21	294
N. America	2190	+7	2183	+137	2053

Activity by Water Depth Information current as of Monday, 7 July 2014

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

WFS Technologies announces the launch of Seatooth® Video

WFS announces the launch of Seatooth® Video, the new improved edition of its subsea wireless video camera.
Seatooth® Video is an upgraded version of WFS' previous Viewtooth® product. The subsea wireless video camera is enhanced with the latest Seatooth® S300 technology and exceeds the underwater wireless video streaming capabilities so far known in the subsea industry.

Seatooth® Video removes the need for a second monitoring ROV and is the ideal solution for subsea construction and IRM activities. It provides a second perspective on complex tasks, and helps ensure that operations are completed "right first time" without the risk of ROV umbilical snags. The camera is capable of providing wireless video streaming at a range of up to 4.5 m, at 4,000 m water depth, in H.264 CIF (352x288) with up to 10 frames-per-second. The control module integrates with ROV Ethernet port and the output files' are .asf format. The wireless video system also integrates with other standard subsea cameras, and an optional primary battery may last up to 10 year in standby mode.

Seatooth® Video ON/OFF mode is controlled by a ROV mounted Seatooth® S300, by an internal real time clock or an external trigger (digital input to video). Options include wireless network control of external lights and an external antenna with lead for up to 6 m range.

Seatooth® Video reduces the time required to complete hot stabs and other complex operations and provides a remote monitoring of subsea equipment and inspections. Seatooth® Video is the perfect tool to be applied in monitoring subsea deployment, intervention and recovery, in monitoring complex maintenance and repair projects, in ROV pilot training, in quality control and decommissioning-monitoring P&A of subsea wells.

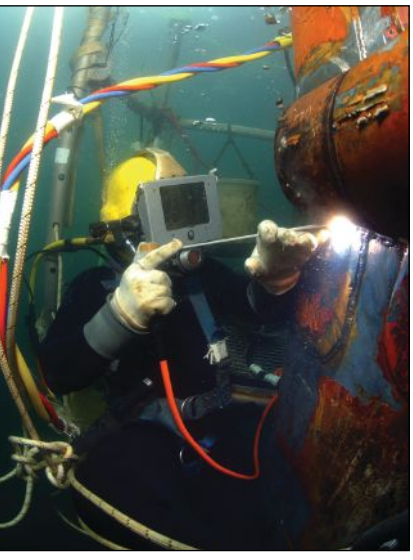
Seatooth® Video is available in three versions: Fixed Perspective with integrated lights, Pan-Tilt-Zoom enabling wide area coverage and the ability to zoom in on detail, and the third option of plugging in a third-party subsea camera.

For more information, visit www.wfs-tech.com.

MacArtney camera protection solution for hyperbaric welding

In response to sustained demand from the professional diving industry, MacArtney has developed an innovative but simple and rugged protection solution for its LUXUS series of compact underwater cameras and lights. The new LUXUS Protection Cap will primarily be used to shield the lens of diver camera and light systems during hyperbaric welding, blasting and cutting operations but can also be used for equipment protection on other mission types.

MacArtney LUXUS units are frequently deployed by commercial diving contractors and operators of remotely controlled systems working with the installation, service, repair and decommissioning of metal structures in harsh subsea environments. While operators need to maintain full visual command of the worksite, divers and equipment are unavoidably required to remain in close proximity to the sparks and liquid metal spatter that is often discharged during hyperbaric welding and cutting. Among other hazards, this means that camera and light systems remain exposed to the negative effects of this incontrollable material, which can easily cause irreversible burn damage to unit lenses.



"We are often contacted by LUXUS users who deploy our equipment on these types of missions and unfortunately, lens damage during underwater welding and cutting seems to be commonplace issue across the industry," says MacArtney Benelux managing director, Ron Voerman. "Therefore, and in accordance with the requirements of our clients, we have developed a simple, user friendly and extremely cost efficient solution which promises to put and end to the problem," Ron Voerman continues.

Manufactured in house from transparent polyurethane with a simple metal strap to provide sealing, the LUXUS Protection Cap is mountable on any type LUXUS compact camera or light model. In case the protection cap sustains damage from sparks or spatter, it is simply disposed of and replaced for the next mission. The LUXUS Protection cap has no significant impact on the performance of the camera or light unit on which it is installed.

Like all other MacArtney LUXUS products, the protection cap has been extensively tested to secure performance and efficiency in harsh underwater environments.

For more information, visit www.macartney.com.

Valeport launches the smallest and most accurate SVP

Production is now underway on Valeport's latest innovation – the new Underwater Vehicle – Sound Velocity Profiler, (UV-SVP), – a small and compact direct reading package aimed primarily at AUV and ROV users, which delivers high accuracy data to compliment survey work.

Valeport's UV-SVP is based on the company's miniSVS and offers a form factor designed for underwater vehicles where space is at a premium.

Measuring sound velocity, temperature and pressure, the UV-SVP uses Valeport's class leading time of flight sound speed sensor, a PRT temperature sensor and a 0.01% accuracy pressure transducer in a compact package weighing just 750 g in air. The lightweight titanium housing gives a depth rating to 3,000 m as standard. A wide range (9-30v DC) isolated power supply and RS232 communications complete the package.

Developed in response to a specific customer requirement, the UV-SVP has already been adopted by Bluefin Robotics for integration into the Bluefin 9 AUV. With a reputation for supplying the world's most accurate sound velocity sensors, Valeport believes there will be strong demand for their small, lightweight and accurate UV-SVP as the AUV market sector continues to grow rapidly.

The UV-SVP, like all Valeport products, benefits from an industry-leading 3-year warranty.

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

Trelleborg's modular marine fenders facilitate the berthing of extra large vessels

Trelleborg Offshore & Construction has been awarded the contract to supply two MV1250 linked corner fender systems and nine MV750 side modular fenders to the port of Longyearbyen in Norway, through contractor A. Våge AS.

The new fenders will be installed along the port's Bykaia quay, allowing

the quay to berth the latest ultra large container and cruise ships. The two MV1250 linked corner fender systems, each of which comprises three modular fender panels, will be installed on either side of seven MV750 side modular fenders at the 84 m quay. One MV750 side panel will also be installed on either side of the quay at 16 m.

For more information, visit www.trelleborg.com.

New Helideck light status system from Tideland Signal

Tideland Signal (Tideland) has introduced a new helideck visual warning system that includes Tideland's HeliLED, in accordance with the UK's CAA CAP 437 regulations for installation on helidecks and helicopter landing pads where there could be a danger to the helicopter or its occupants from hazards such as the presence of gas, flammable liquids or a crane in the vicinity.

The new helideck light status system comprises one or two main status lights, HeliLED, each with a red LED flasher housed in an Exd well glass enclosure. Tideland also offers repeater lights to assist a helicopter already on the helideck to see a red light at any angle or degree of azimuth.

The HeliLED light status system has a small Exd control panel and is capable of both automatic operation (input from a fire and gas system) and manual activation by the helideck landing officer. The main status light can also be dimmed in intensity while the helicopter is landed on the helideck. Tideland's LED technology ensures long service life (80,000 hrs) and low maintenance requirements.

Tideland also offers a battery back-up system for the HeliLED light status system, comprising an Exd-certified battery charger and vented battery box. The complete system, including the battery back-up option is certified under ATEX for use in Zone 1 hazardous areas.

For more information, visit www.tidelandsignal.com.

Birns introduces new chamber light magnetic base mount

BIRNS, Inc. has introduced an innovative new mounting option for its popular lines of Doubly-Safe and General-Area Chamber lights – the BIRNS Chamber Light Magnetic Base Mount.

This powerful chrome-plated magnetic base allows easy installation and repositioning of all BIRNS chamber lights on curved or flat metal surfaces. The mount is designed for use in all pressurized HeO_2-atmosphere PVHO chambers, from submersibles, diving bells and personnel transfer capsules to decompression, recompression and hyperbaric chambers.

The low-profile BIRNS Chamber Light Magnetic Base Mount has a 4.90 in. diameter, and a height of .49 in., making it ideal for systems with space constraints. The round ceramic-8 ring is composed of highly magnetized castings, providing a powerful magnetic field. The base has two integral bolts and acorn nuts to safely secure the chamber light. This powerful mount provides great versatility in lighting options – users can quickly switch from general area lighting to bunk illumination and back again by simply changing the position of the base. Plus, installation is quick and easy, both on deck and in pressurized chambers while at sea.

For more information, visit www.birns.com.

New PVC submersible pressure transducers featuring improved chemical compatibility and temperature range

Automation Products Group, Inc. (APG) introduces PT-503 Submersible Pressure Transducers. Specifically built for chemical compatibility, they feature a PVC housing. As a result, these pressure transducers deliver long life and reliable operation in environments with regular and prolonged exposure to harsh and potentially corrosive chemicals – even at temperatures from -30°F to 130°F and depths to 450 ft.

PT-503 pressure transducers are available with numerous options and features to support specific application needs, including:

- 4-20 mA, Modbus, 0-5 VDC, and mV/V outputs
- Three cable options for improved chemical compatibility, including Hytrel®, PVC, and Urethane
- A Teflon® coated or a ceramic transducer face
- A breathable hydrophobic vent tube cap that filters out moisture

These pressure transducers also feature temperature compensation, built-in lightning protection, and are quickly and easily zeroed in the field.

For more information, visit www.apgsensors.com.

Heavy duty ORTs from Sonardyne

Subsea 7 has taken delivery of a consignment of acoustic release transponders and accompanying heavy duty release frames from Sonardyne International Ltd. The Oceanographic Release Transponders (ORTs) will be used, up to 17 at a time, to assist with the installation of 20 structures being lowered to the seabed via an offshore construction vessel. Once these are landed, the ORTs will be acoustically commanded to 'open' and detach the lifting slings from their load.

Recognized for their reliability, durability and long operating range, ORTs are in service with many scientific, defense and commercial organizations that rely upon them for the deployment and recovery of equipment. The acoustic releases ordered by Subsea 7 are depth rated to 2,000 m and suitable for a wide range of instrument mooring and remote release applications.

For more information, visit www.sonardyne.com.

Chesapeake Technology's SonarWiz now supports EdgeTech real-time bathymetry systems

Chesapeake Technology Inc. (CTI) is a world leader in real-time acquisition and GIS-based processing software for seafloor mapping. CTI is pleased to announce a major advance to its flagship software SonarWiz processing with the addition of a Real-Time Acquisition Server for the EdgeTech 4600 and recently introduced EdgeTech 6205 interferometric bathymetry systems.

The EdgeTech bathymetry systems are unique in the industry offering advanced wide swath bathymetry with no nadir gap and true co-registered dual frequency side scan sonar. SonarWiz now not only offers data processing for the EdgeTech interferometric bathymetric data, but the ability to collect and map real-time bathy data along with the side scan data. It opens a whole new simpler way to collect and visualize the data in real-time.

SonarWiz is the software that has streamlined the processing and acquisition of side scan sonar, sub-bottom profiler and magnetometer data and now includes new bathymetric processing capabilities. This allows users to bring together, in one unified GIS workspace, all the data from these different geophysical sensors. SonarWiz Bathy gives the user all the tools required to edit the bathymetric data, etc. and to produce high-resolution depth maps. By integrating the processed bathymetry data with side scan data, 3D side scan sonar mosaics can be generated giving a whole new visual dimension to seafloor data. SonarWiz Bathy will be a great advantage to the data processor and analyst, simplifying the processing tasks, saving time and project costs.

For more information, visit www.chesapeaketech.com.

KBR selects AVEVA Everything3D for global projects

AVEVA announced that KBR, a global engineering, construction and services company, has substantially extended its utilization of AVEVA technology, which includes the selection of AVEVA Everything3D (AVEVA E3D). The new contract enables KBR to deploy AVEVA E3D along with an increased number of AVEVA solutions on major capital projects around the world.

"We have a long standing relationship with AVEVA and we expect that AVEVA E3D will give us additional capabilities and flexibility to meet the needs of our customers," said Farhan Mujib, executive vice president, KBR operations. "AVEVA E3D is also fully interoperable with our current AVEVA PDMS environment, allowing us to quickly deploy the software on new or existing projects. We're excited about the new integrated functionality solution, which will be a game changer for our project users."

KBR has been an AVEVA customer for more than 25 years and has contributed to the product strategy and roadmap development, including the unique capabilities of AVEVA E3D. It combines the latest 3D graphics and user interface technologies with state-of-the-art data management to deliver the most comprehensive, productive and tightly integrated 3D plant design solution available.

"We have a successful history with KBR and we are proud to see their commitment extending to AVEVA E3D as part of a larger integrated engineering & design strategy. KBR has a reputation for executing some of the world's most challenging projects and the selection of AVEVA E3D is very rewarding for our entire team," said Dave Wheeldon, CTO from AVEVA.

PRODUCT SPOTLIGHT

Antcom Corporation's New Ruggedized Helical Marine Antenna Series

Antcom's new Ruggedized Helical Marine Antenna Series is specifically designed for processional and military marine and deep-sea GPS/GNSS + Communication applications, including vessel, buoy, seismic, hydrographic and offshore exploration equipment.

The Ruggedized Helical Marine Antenna Series features a distinctive high-performance, high-gain quadrifilar antenna design with a radiation pattern ideal for high dynamic, motion and swaying, indicative of marine applications.

This Antcom antenna series is suited for a wide range of GNSS (Global Navigation Satellite Systems)-based positioning, navigation and timing applications, including GPS L1/L2/L5, GLONASS L1/L2, Galileo E1/E2/E5/E6, BeiDou B1/B2/B3, IRNSS, and L-band SBAS (Satellite Based Augmentation Systems) for very high-accuracy applications, such as OmniSTAR and Veripos, combined with L-band based satellite communication applications, such as Inmarsat, Iridium, Globalstar and Thuraya, and ground-based communication systems in the cellular (quad-band/GSM), 2.4GHz (WiFi), S and C frequency bands.

This marine antenna series boasts a rugged conical-shaped, hermetically sealed, Teflon®-coated enclosure that is resistant to harsh and highly corrosive environments. These antennas are also available in a wide range of colors, connectors, cabling, pipe and bracket mounting options, and meet several regulatory standards and military specifications, including FAA-TSO-C144, DO-160D, MIL-STD810 and more. Please consult its datasheet for the complete specifications.

Download the product catalog at http://www.antcom.com/documents/catalogs/Antcom_New_Ruggedized_High_Corrosion_Resistant_Buoy_Antennas.pdf.

Antcom Corporation is a leading manufacturer of high-end navigation, positioning, timing and communication antennas for the survey, agriculture, aviation, military, marine and timing markets. Antcom produces GPS/GNSS, UHF, GSM, ISM, Iridium, Globalstar, Inmarsat, Thuraya, Sirius XM, and Video/Data Link antennas in the L, S, C, X, and Ku bands. www.antcom.com

"Rapidly implementing new technology and controlling project risk are fundamental challenges for all our customers. It's great to see how AVEVA E3D can be used by companies like KBR to optimize their engineering and design processes. KBR is a true industry leader and we look forward to contributing to the success of their business for many years to come."

For more information, visit www.aveva.com.

DANTE system sales success and product line expansion

Soundnine Inc. (S9), Kirkland, Washington (USA) announces the recent shipment of 8 DANTE Buoy Controller Systems with a new Solar PowerPak. S9 Value Added Partner and systems integrator Imbros Pty. Ltd. of Hobart, Tasmania will install the Buoy Controllers, Solar PowerPaks and Sea-Bird Scientific water quality monitoring instruments on locally fabricated buoys, producing turnkey monitoring systems with Iridium data telemetry.

The robust mechanical designs of the

Controller and PowerPak permitted a smaller, simplified and less costly buoy. The turnkey DANTE System provides a total solution for measurement acquisition, data delivery, and data display and management. It also afforded huge savings in system development cost, enabling Imbros to meet tight budget and delivery requirements.

The DANTE Buoy Controller was introduced at Oceans 2013. The new Solar PowerPak will make its public debut at Oceans 2014. It and consists of a robust "DANTE style" submersible enclosure containing light weight lithium-ion batteries and charge controller. It can be used with up to four plug-in solar panels that are immersion-proof, corrosion-proof and extremely robust, thanks to a unique reinforced composite construction.

For more information visit www.soundnine.com.

Commodity jurisdiction issued for iXblue OCTANS fiber optic gyroscope and PHINS internal navigation systesm

iXBlue Inc. is pleased to announce that the U.S. Department of State has issued commodity jurisdiction (CJ) rulings for their OCTANS and PHINS FOG Based Navigation products, confirming that control for export of both units from the U.S. will be administered through the Department of Commerce under their export administration regulations (EAR) process.

The EAR Export Commodity Control Number (ECCN) for both OCTANS and PHINS is 7A003 NS1, AT1. This ruling removes any concern about ITAR overheads and provides customers who use OCTANS and/or PHINS with an invaluable opportunity for international growth. Contact your export professional to find out how this change in classification could offer a unique competitive advantage.

OCTANS is a strap-down north-seeking Attitude Heading Reference System (AHRS), which outputs true heading, roll, pitch, heave, surge, sway, acceleration and rate of turn. The unit is IMO-certified, small, lightweight, low power with Ethernet and serial interfaces, web-based MMI and all processing packaged in a single housing. The OCTANS is ideal for navigation of small-to-medium sized surface vessels and other above- and below-water applications where TCO, ROI, performance and low footprint are essential.

PHINS is a strap-down north-seeking Inertial Navigation System (INS) that provides position, true heading, attitude, speed, depth and heave. PHINS is compatible with multiple external aiding sensors and provides unsurpassed operational performance in complex marine surface and subsurface environments in latitudes as high as 88.5 degrees North. Applications include AUV guidance, dynamic positioning for drill ships and ROV orientation.

Both products are extensively used in North America by maritime security agencies, oil and gas companies, Merchant ships, yacht owners, and in the survey and hydrography markets.

For more information, visit www.ixblue.com.

Baker Hughes Inc. said **Mike Sumruld** was named vice president and treasurer. He brings more than 20 years of diversified financial expertise. Sumruld started his career at Baker Hughes in 1998 and worked most recently as vice president of financial planning and analysis, eastern hemisphere based in Dubai. Prior to this role, Sumruld served as director of investor relations and he also previously served as vice president of financial planning and analysis for the western hemisphere. Sumruld has held a range of geographic financial roles covering the United States, Latin America and the eastern hemisphere as well as global financial roles covering several product lines, including drill bits, drilling services, chemicals, and drilling and completion fluids. He earned his MBA at Texas A&M and his undergraduate business degree at the University of Houston.

Tudor, Pickering, Holt & Co. said **Paul F. Perea**, 43, was named managing director and general counsel of the firm. Perea was previously a partner with Baker Botts, specializing in mergers and acquisitions, securities offerings and general corporate and securities matters. "He will be an invaluable resource to our investment bankers, investment managers, and other team members as we continue to provide leading edge services to our clients, from mergers and acquisitions advisory services to asset management capabilities," noted Bobby Tudor, chief executive officer of the firm. Perea, who will be based at the firm's Houston, Texas, headquarters, was named to the executive management committee. Perea holds a BA in government with high honors from The University of Texas at Austin and a JD from Vanderbilt University School of Law. He spent more than 15 years with Baker Botts in its Houston office.

Perea

Aker Solutions recruited **David Phillips** from HSBC Global Equity Research as head of industry and investor relations. Phillips, 43, served as global co-head of oil and gas research and managing director at HSBC since mid-2011 after joining the bank as an analyst in 2005. He earlier specialized as an analyst covering the chemicals sector for banks including Commerzbank, Morgan Stanley and Dresdner Kleinwort Benson. Phillips will be based at Aker Solutions' London office and report to the company's chief financial officer. He has a BA in chemistry from Oxford University and a PhD in chemistry from Cambridge University.

Cal Dive International, Inc. said **Brent D. Smith**, the company's chief financial officer, voluntarily resigned from the company effective June 13 to pursue other opportunities. The company said it commenced a search for a replacement and would consider both internal and external candidates. Until a new chief financial officer is named, **Quinn J. Hébert**, the company's chairman, president and chief executive officer assumed the additional responsibilities of chief financial officer. He agreed to make himself available to assist during the transition.

Pacific Drilling S.A. said **Michael Acuff** joined the company as senior vice president of sales and business development. He will be based in Houston and responsible for management and administration of all company sales, contract acquisition and corporate planning activities. Acuff most recently was senior vice president of contracts and marketing at Diamond Offshore. His extensive industry experience includes more than a decade at Transocean.

The Woods Hole Oceanographic Institution has appointed **James Bellingham** as the first director of its Center for Marine Robotics. Bellingham will come to WHOI in early fall 2014 from the Monterey Bay Aquarium Research Institute (MBARI), where he was director of engineering and most recently chief technologist. Bellingham earned his Ph.D. from Massachusetts Institute of Technology, where he was founder and manager of the Autonomous Underwater Vehicle Laboratory. He was also co-founder of Bluefin Robotics in 1997, a Massachusetts-based company that develops, builds and operates autonomous underwater vehicles.

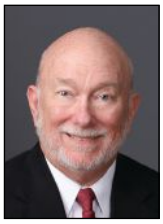

Bellingham

Leading offshore cable protection specialist Tekmar Energy has reinforced its senior management team with the appointments of a non-executive technical director and a technical sales manager. **Dr. Terry Sheldrake** and **Charlie Sullivan** have taken up the respective roles that further underpin Tekmar's engineering-led technical expertise. Dr. Sheldrake, a specialist in developing technology strategy, will support the development and implementation of the firm's innovative products servicing both the oil and gas and offshore wind industries. He joins Tekmar after 15 years in the post of technology leader at GE Wellstream. Mr. Sullivan joins Tekmar from Wilton Engineering where he was also technical sales manager. He will be responsible for further driving forward Tekmar's commercial and business development for new projects while also providing technical support for engineering led enquiries.

Hydro Group plc has strengthened its management team with two senior appointments. **Lynn Rennie** joins Hydro Group in the position of program manager, handling a range of projects across the engineering, production, logistic and quality departments. She will be responsible for establishing individual cross functioning teams for each project and throughout its lifecycle ensuring it is delivered on time, while adhering to Hydro Group's stringent safety and quality requirements and remaining within budget. Ms. Rennie brings 14 years project management experience to the position. **Ian Walters** joins Hydro Group as engineering manager, overseeing a team of 15 engineers and draughtsmen, handling a range of engineering projects from conception to completion. Mr. Walters brings 12 years managerial experience to the role, most recently having held the position of team manager at EnerSys Advanced Systems, a global leader in stored energy solutions for industrial applications.

William Boll is Horizon Marine's second oceanographer to be hired in the last 2 months, further bolstering the company's capabilities. Boll graduated from the Georgia Institute of Technology with a B.S. in Physics. He then completed his M.S. in Physical Oceanography while also obtaining a Graduate Certificate in Modeling and Simulation Engineering at Old Dominion University in Norfolk, Virginia. His thesis involved analyzing observed Doppler shifted internal waves generated by tidal interactions with local bathymetry in a shallow water region off the coast of New Jersey.

Greene's Energy Group, LLC (GEG), a leading provider of integrated testing, rentals and specialty services, has named **Terry Hatcher** vice president of human resources. Based in Houston, Hatcher will be responsible for strategic human resource planning, employee relations, and benefits and compensation design. Hatcher has more than 25 years of human resource experience and specializes in mergers and acquisitions. He previously served in the same position for Stewart & Stevenson, Weatherford Global Compression Services and AppleTree Markets Inc. He was also the director of human resources for the Oil & Gas Division of General Electric Co. Hatcher earned a bachelor's degree in human resources and a master's degree in psychology from Texas A&M University – Commerce. He also has a Senior Human Resource Professional certification. Additionally, he maintains an active membership in the American Society of Training and Development and is a board member of HR Houston.


Hatcher

Aquatic Engineering & Construction Ltd, an Acteon company, has appointed **Martin Charles** as regional general manager, Europe, Middle East and Africa (EMEA). This appointment contributes to Aquatic's business strategy for 2014 and its ambitious expansion programme, which will improve customer service worldwide. Charles will lead the company's market development and project delivery across the EMEA region from Aquatic's headquarters in Aberdeen, UK. He has a wealth of experience in oil and gas and associated market sectors, most recently with JDR Cable Systems Ltd, as the global services director responsible for developing the installation, aftermarket and maintenance business worldwide for JDR.

TE Connectivity Ltd., a world leader in connectivity, announced that it has entered into a definitive agreement to acquire Measurement Specialties, Inc. for $86 cash per share or a total transaction value of approximately $1.7 billion (including assumption of net debt). Measurement Specialties, a leading global designer and manufacturer of sensors and sensor-based systems with expected revenue of $540 million in its current fiscal year, offers a broad portfolio of sensor technologies including pressure, vibration, force, temperature, humidity, ultrasonics, position and fluid, for a wide range of applications and industries.

Chinese **Smartsea Technology Co.**, Ltd has become an authorized reseller of EIVA software and hardware solutions for the offshore industry. Headquartered in Wuxi, which is situated approximately 130 km northwest of Shanghai, Smartsea Technology will contribute to the penetration of the Chinese market, which has already shown great interest in especially the EIVA NaviSuite software and ScanFish range of remotely operated towed vehicles.

Global subsea equipment solutions specialist **Ashtead Technology** has secured an exclusive sales distribution agreement with Sound Metrics Corporation, a leading sonar imaging manufacturer, for the sale of DIDSON and ARIS imaging sonar systems to the oil and gas market in the UK and Singapore regions.

Prysmian Group, world leader in the energy and telecom cables and systems industry, has finalized the acquisition of the remaining 34% interest in AS Draka Keila Cables, thereby becoming the sole shareholder of this Estonian cable company, which joined the Group following the acquisition of Draka in 2011. The price of this acquisition amounts to €6.2 million and takes into consideration a positive net financial position (cash) of approximately €4.9 million at the end of 2013.

Unique Maritime Group is pleased to announce a pivotal strategic equity investment from Blue Water Energy. The new partnership will allow UMG to accelerate its growth plans through additions to its Rental fleet, as well as through further acquisitions, to expand the product & service offering and geographic distribution. UMG has an impressive line-up of products and services for the marine, diving, survey, NDT and inspection and oil & gas sectors.

Electronic Navigation Ltd. and **FURUNO Electric Co. Ltd** of Japan, have announced that FURUNO will take an initial 10% shareholding in ENL and its wholly owned subsidiary WASSP Ltd.

CALENDAR & EVENTS

August 12-14, 2014
Deepwater Intervention Forum
Galveston, TX
www.deepwaterintervention.com

August 25-28, 2014
Offshore Northern Seas
Stavanger, Norway
www.ons.no/2014

September 3-5, 2014
Oceanology International China
Shanghai, China
www.oichina.com.cn

September 14-19, 2014
Oceans '14 MTS/IEEE
St. John's, Newfoundland
www.oceans14mtsieeestjohns.org

September 15-17, 2014
Int'l Conf. on Offshore Renewable Energy
Glasgow, UK
www.marinescienceandtechnology.com

September 22-25, 2014
Maritime Security Conference
Oxford, UK
www.maritimesecurityconference.org

October 6-9, 2014
Oceanic Engineering Society IEEE AUV
Southhampton, UK
www.auv2014.org

October 7-9, 2014
AWEA Offshore Windpower
Atlantic City, NJ
www.awea.org

October 13-15, 2014
WJTA-IMCA Expo
New Orleans, LA
www.wjta.org

October 13-17, 2014
Sea Tech Week
Brest, France
www.seatechweek.com/

October 14-15, 2014
MTS Dynamic Positioning
Houston, TX
www.dynamic-positioning.com

October 14-16, 2014
Deep Offshore Technology International
Aberdeen, Scotland
www.deepoffshoretechnology.com

October 27-29, 2014
SPE ATCE
Amsterdam, The Netherlands
www.spe.org

October 27-31, 2014
Meeting of Acoustical Society of America
Indianapolis, IN
www.acousticalsociety.org

October 28-29, 2014
Offshore Energy
Amsterdam, The Netherlands
www.offshore-energy.biz

November 1-5, 2014
Restore America's Estuaries
Washington, D.C.
www.estuaries.org

November 4-6, 2014
Deepwater Operations
Galveston, TX
www.deepwateroperations.com

November 5-7, 2014
Oil Comm
Houston, TX
www.oilcomm.com

OCEAN NEWS & TECHNOLOGY 2014 EDITORIAL CALENDAR

www.oceannews.com

JANUARY
Editorial: Forecast: 2014 and Beyond; GIS/Mapping
Distribution: GOM Oil Spill & Ecosystem; Subsea EXPO;
Product & Services Focus: Multibeam & Side Scan Sonars; Research & Development Services

FEBRUARY
Editorial: Oceanology & Meteorology; Decom & Abandonment
Distribution: NACE Corrosion; Decommissioning and Abandonment Summit; Oceanology International
Product & Services Focus: Buoys & Monitoring Instrumentation; Environmental Monitoring/Testing Services

MARCH
Editorial: Subsea Fiber Optic Networks; Maritime Security
Distribution: GMREC; Offshore Well Intervention Conference
Product & Services Focus: Connectors, Cables & Umbilicals; Diver Detection Systems

APRIL
Editorial: Offshore Technology; Ocean Mapping & Survey
Distribution: OTC; AUVSI; Well Control and Containment Conference
Product & Services Focus: Subsea Tools & Manipulators; Offshore Risk Assessment; Training/Safety

MAY
Editorial: UW Imaging & Processing; Marine Salvage/UW Archeology
Distribution: Energy Ocean; Seawork International; UDT
Product & Services Focus: Magnetometers; Water Dredges & Airlifts; Diving Services

JUNE
Editorial: AUVs & Gliders; Defense & Naval Systems; *Industry in Action*
Distribution: TBD
Product & Services Focus: Tracking & Positioning Systems; Seismic Monitoring Equipment Leasing/Rental Services

JULY
Editorial: Workclass ROVs; Deepwater Pipeline/Repair/Maintenance
Distribution: Offshore Northern Seas
Product & Services Focus: Cameras, Lights & Imaging Sonars; Oil Spill Clean-Up Services

AUGUST
Editorial: Ocean Observing Systems; Subsea Telecom
Distribution: Oceans'14 MTS/IEEE
Product & Services Focus: Water Sampling Equipment; Cable Installation Services

SEPTEMBER
Editorial: Ocean Engineering; Marine Construction; *Corporate Showcase*
Distribution: SPE ATCE; AWEA Offshore Windpower; Sea Tech Week; MTS Dynamic Positioning
Product & Services Focus: Navigation, Mapping & Signal Processing; Data Processing Services

OCTOBER
Editorial: Offshore Communications; Subsea Inspection, Monitoring, Repair and Maintenance
Distribution: OilComm; North Sea Decommissioning; Submarine Cable Forum; International Conference on Ocean Energy; Euronaval
Product & Services Focus: Acoustic Modems, Releases & Transponders; Marine Communications; Survey & Exploration Services

NOVEMBER
Editorial: Offshore Support, Supply & Emergency Vessels; Deep Sea Mining
Distribution: Clean Gulf; International Workboat
Product & Services Focus: Ship Protection Systems; Winches & Control Systems; Vessel Charter/Leasing Services

DECEMBER
Editorial: Light Workclass ROVs; Commercial Diving; *Year in Review*
Distribution: Underwater Intervention
Product & Services Focus: Diving Equipment & Services; Buoyancy Materials; Construction & Repair Services

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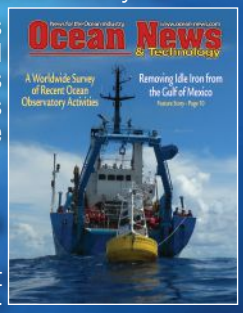

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International
Zinat Hassan
+44 (0) 845 6522 483
zhassan@tscpublishing.com

Mimi Shipman
+44 (0) 777 601 7564
mshipman@tscpublishing.com

Editorial
Ladd Borne
772-285-8308
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MetOcean
21 Thornhill Drive
Dartmouth, Nova Scotia
B3B 1R9 Canada
Tel: +1 902 468 2505
Fax: +1 902 468 4442
E-mail: emily@metocean.com
Website: www.metocean.com
Contact: Emily MacPherson

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Subsalve USA
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Fax: 401-884-8868
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Falmat Cable
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San Marcos, CA 92078
Toll Free: 800 848 4257
Tel: +1 760 471 5400
Fax: +1 760 471 4970
E-mail: sales@falmat.com
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Contact: Shawn Amirehsani

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Idyllwild, CA 92549
Phone: (951) 659-2183
Fax: (951) 659-3958
Contact: Gary Brown, Sales Manager
Email: Sales@southbaycable.com
Website: www.southbaycable.com

Since 1957, South Bay Cable Corp has designed and manufactured specialized electrical, electro-mechanical and electro-optical-mechanical cables for use in demanding marine environments. Cables are designed to meet customer requirements and include tether and umbilical cables for ROVs, tow cables, video inspection, faired cables and a host of other customer specific applications.

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Website: www.teledyne-tss.com
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E-mail: service@birns.com
Website: www.birns.com
Contact: Eric Birns

BIRNS, Inc. is an ISO 9001:2008 certified global leader in the design and manufacturing of high performance connector and lighting solutions for the subsea industry. With more than half a century of expertise, BIRNS provides unmatched lead times and industry-leading exclusive features. Its world class molding facility is NAVSEA S9320-AM-PRO-020 certified, and the company specializes in sophisticated connector products and custom cable assemblies—with electrical, optical, electro-optical, electro-coax, and EOM (electro-opto-mechanical) connector lines. BIRNS leads the industry with high volume hydrostatic and helium pressure testing—its vast range of electrical penetrators is ABS Product Design Assessment (PDA) certified, with inclusive pricing and lead times for ABS/DNV witnessing. BIRNS is equally renowned for its lines of innovative LED and tungsten-halogen marine, chamber and commercial diving lights, and revolutionary MPI-NDT equipment.

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Pawtucket, RI 02860 USA
Tel: +1 401 723 4242
Fax: +1 401 753 6342
E-mail: sales@birnsaquamate.com
Website: www.birnsaquamate.com
Contact: Eli Bar-Hai

Birns Aquamate 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. BIRNS Aquamate is the only underwater connector producer that guarantees compatibility 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 (Seascape) as well as dealers in Canada, Italy, Russia, China, and Brazil.

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Fax: +1 619 562 9706
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The SEA CON® Group are world 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 Oceanographic, Defense, Oil and Gas and Environmental markets. With locations in California and Texas, USA, Mexico, Brazil, the United Kingdom and Norway and a worldwide network of agencies and representatives, SEA CON® is able to supply very quick solutions to any requirements across the globe.

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Geometrics, Inc.
2190 Fortune Drive
San Jose, CA 95131
Tel: +1 408 954 0522
Fax: +1 408 954 0902
E-mail: sales@geometrics.com
Website: www.geometrics.com
Contact: Ross Johnson

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

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E-mail: sales@bgbtechnology.com
Website: www.bgbtechnology.com
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1 Blackmoor Lane
Croxley Business Park
Watford, Hertfordshire WD18 8GA
Tel: +44 (0) 1923 216020
Fax: +44 (0) 1923 216061
E-mail: tsssales@teledyne.com
Website: www.teledyne-tss.com
Contact: Carolyn Jones

USA Office: 7701 West Little York, Suite 300
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Tel: +1 713 461 3030, Fax: +1 713 461 3099

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Geometrics, Inc.
2190 Fortune Drive
San Jose, CA 95131
Tel: +1 408 954 0522
Fax: +1 408 954 0902
E-mail: sales@geometrics.com
Website: www.geometrics.com
Contact: Ross Johnson

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

Marine Magnetics Corp.
135 Spy Court
Markham, Ontario,
Canada L3R 5H6
Tel: +1 905 479 9727 x232
E-mail: info@marinemagnetics.com
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Dartmouth, Nova Scotia
Canada B3B 1T6
Tel. +1 (902) 466-7000
Fax. +1 (902) 466-4880
Email: Sales@romor.ca
Website: www.romoroceansolutions.com
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3900 C Street, Suite 700
Anchorage, AK 99503
Tel: +1 907 339 6200
Fax: +1 907 339 5475
Email: Paul.Ramert@asrcenergy.com
Website: www.asrcenergy.com
Contact: Paul Ramert, Vice President/General Manager, Regulatory and Technical Services

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8502 SW Kansas Avenue
Stuart, FL 34997
Tel: +1 772-219 3000
Fax: +1 772-219 3010
E-mail: tmartin@conshelf.com
Website: www.csaocean.com
Contact: Tony Martin

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Kongsberg Seatex AS
Pirsenteret
N-7462 Trondheim, Norway
Tel: +47 73 54 55 00
Fax: +47 73 51 50 20
E-mail: km.seatex@kongsberg.com
Website: www.km.kongsberg.com/seatex
Contact: Finn Otto Sanne at finn.otto.sanne@kongsberg.com

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Watford, Hertfordshire WD18 8GA
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Fax: +44 (0) 1923 216061
E-mail: tsssales@teledyne.com
Website: www.teledyne-tss.com
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Contact : Valérie Le Pen - vlepen@nke.fr or Goulven Prud'homme - gprudhomme@nke.fr
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Contact: Patrice Brault - pbrault@nke.fr

Nortek AS
Vangkroken 2
1351 Rud, Norway
Tel: +47 6717 4500
E-mail: inquiry@nortek.no

Nortek USA
27 Drydock Avenue
Boston, MA 02210
Tel: +1 617 206 5750
Email: inquiry@nortekusa.com
Website: www.nortek-as.com

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Ontario Canada K2K 2M5
Tel: +1 613 599 8900
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Tel: +1 425 643 9866
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Skeidaras 12, 210
Gardabaer, Iceland
Tel: +354 533 6060
Fax: +354 533 6069
E-mail: baldur@star-oddi.com
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14391 South Dowling Road
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Fax: +1 979 693 6389
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Toll Free: +1 877 316 8049 x149
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Toll free: +1 800 786 5824 (7-VOLTAGE)
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Website: www.tinitron.com
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11 Klein Drive
Salem, NH 03079
Tel: +1 603 893 6131
Fax: +1 603 893 8807
Email: Klein.Mail@L-3com.com
Web: www.L-3Klein.com
Contact: Deborah Durgin, Supervisor, Marketing & Sales

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P.O. Box 730
White Marsh, VA 23183-0730
Toll Free: +1 800 447 4804
E-mail: jdemille@marinesonic.com
Website: www.marinesonic.us

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Nygardsviken 1, 5164
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New Industries
6032 Railroad Avenue
Morgan City, LA 70380
Tel: +1 985 385 6789
E-mail: bill.new@newindustries.com
Website: www.newindustries.com
Contact: Bill New

New Industries provides quality fabrication services to the offshore oil & gas and marine industries focusing on large diameter pressure vessels, suction piles, DNV buildings and deepwater subsea production equipment such as jumpers, PLETs, PLEMs and manifolds.

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Seanic Ocean Systems
8860 Fallbrook Drive
Houston, TX 77064
Tel: +1 713 934 3100
E-mail: info@seanicusa.com
Website: www.seanicusa.com
Contact: Karen North

Seanic was formed to address the growing demand for simple, rugged and reliable subsea tooling for remote intervention. Along with engineered solutions, Seanic also offers experience in the design, manufacturing, storage, repair & maintenance of subsea products. Seanic provides a worldwide standard product line of ROV tooling such as torque tools, FLOT's, hot stabs, manifolds, buckets and ROV interface panels.

Subsea Americas
3447 Hwy 182
P.O. Box 185
Berwick, LA 70342
Tel: +1 985 714 1767 or 985 518-0055
E-mail: charles@subseaamerica.com
Website: www.subseaamericas.com
Contact: Charles Mayea

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1321 Nelius Road
P.O. Box 767
Bellville, TX 77418 USA.
Tel: +1 979 865 8846
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E-mail: sales@seacon-ap.com
Website: www.seacon-ap.com

SEACON Advanced Products, LLC., manufactures a wide variety of versatile and robust switches to suit a number of applications. These include Limit, Positive Action and Proximity switches in a range of materials including Titanium, Plastic and Stainless Steel which can be supplied in varying load capacities up to 7 amps and pressure rated to 10,000 psi. To further aid simplicity, our proven range of Modular Proximity Switches have been integrated with the Micro WET-CON electrical wet-mate connector making this switch a very modular component that is easily installed and replaced in the field, but without compromising reliability.

UNDERWATER VEHICLES/AUVS

Exocetus Development LLC
1444 East 9th Avenue
Anchorage, AK 99501
Tel: 858-864-7775
Fax: 907-569-0268
Contact Ray Mahr
Email: sales@exocetus.com
Website: www.exocetus.com

The Exocetus Coastal Glider, designed for coastal waters where high currents and large variations in water densities occur, has a larger buoyancy engine than legacy gliders, enabling the glider to operate in 2+ knots of current, handling water densities from 7 - 37 ppt, operate for 60 days with a lithium battery and integrate additional sensors.

Hydroid, Inc.
a subsidiary of Kongsberg Maritime
6 Benjamin Nye Circle
Pocasset, MA 02559-4900 USA
Tel: +1 508 563 6565
Fax: +1 508 563 3445
E-mail: glester@hydroid.com
Website: www.hydroid.com
Contact: Graham Lester

Hydroid, a subsidiary of Kongsberg Maritime, is the world leader in manufacturing advanced Autonomous Underwater Vehicles (AUVs). REMUS AUVs provide innovative and reliable systems for the marine research, defense, hydrographic and offshore/energy markets. Hydroid vehicles represent the most advanced, diversified and field-proven family of AUVs and support systems in the world.

OceanServer Technology, Inc.
151 Martine Street
Fall River, MA 02723 USA
Tel: +1 508 678 0550
Fax: +1 508 678 0552
E-mail: sales@ocean-server.com
Website: www.iver-auv.com
Contact: Jim Kirk

OceanServer Technology, Inc. is a leading provider of man-portable Autonomous Underwater Vehicles (AUVs) with over 200 AUVs deployed worldwide. The Iver AUV is an affordable, commercial vehicle used for general survey and sub-surface security work, and serves as a research platform for autonomy, behavioral and sensor development studies at universities and navy research facilities.

UNDERWATER VEHICLES/ROVS

Deep Ocean Engineering Inc.
2528 Qume Drive, Suite 11
San Jose, CA 95131 USA
Tel: +1 408 436 1102
Fax: +1 408 436 1108
E-mail: sales@deepocean.com
Website: www.deepocean.com
Contact: Bill Charbonneau

Deep Ocean Engineering, Inc. provides remotely operated and unmanned surface vehicle (ROV / USV) solutions which are used by a broad range of industry applications - security, military, nuclear and hydroelectric power plants, inshore dams and lakes, oil and gas, scientific research, fisheries, salvage, search / recovery, and pipeline inspections.

i-Tech
22330 Merchants Way
Katy, TX 77449
Tel: +1 281 693 9403
E-mail: Katarina.Tehlirian@Subsea7.com
Website: www.interventiontechnology.com
Contact: Katarina Tehlirian

i-Tech is a global division of Subsea 7 delivering world class remotely operated vehicle (ROV) and intervention tooling support services to the offshore energy industry, operating from four regional centers: Europe & Africa, Asia-Pacific the Americas and Brazil.

Perry
10344 Sam Houston Park Drive, Suite 300
Houston, TX 77064
Tel: +1 713 329 8230
Fax: +1 713 329 8299
E-mail: subsea.sales@f-e-t.com
Website: www.f-e-t.com/Subsea

Forum Energy Technologies' Perry 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.

Schilling Robotics, LLC
260 Cousteau Place
Davis, CA 95618
Tel: +1 530 753 6718
Fax: +1 530 753 8092
Contact: Peter MacInnes
E-mail: peter.macinnes@fmcti.com
Website: www.fmctechnologies.com

Schilling Robotics, a business unit of FMC Technologies, is a leading global producer of high-technology subsea systems, including remotely operated vehicles (ROVs), manipulators, and custom-engineered systems for subsea production. We bring nearly 30 years of technological expertise and innovation to the challenges facing customers in the subsea environments. www.fmctechnologies.com.

SeaBotix Inc.
2877 Historic Decatur Road, Suite 100
San Diego, CA 92106 USA
Tel: +1 619 450 4000
Fax: +1 619 450 4001
E-mail: Info@SeaBotix.com
Website: www.SeaBotix.com

SeaBotix is a world leading manufacturer of capable underwater MiniROVs that perform a multitude of tasks including maritime security, search and recovery, hull and pipeline inspection, hazardous environment intervention, aquaculture, sensor deployment and oceanographic research. The Little Benthic Vehicle systems have become the benchmark in compact ROVs around the world.

Sub-Atlantic
Woodburn Rd.
Blackburn Business Park
Blackburn, Aberdeen
AB21 0PS, Scotland
Tel: +44 (0) 1224 798660
Fax: +44 (0) 1224 798661

10344 Sam Houston Park Drive
Suite 300
Houston, TX 77064
Tel: +1 713 329 8730
Fax: +1 713 329 8299
E-mail: subsea.sales@f-e-t.com
Website: www.f-e-t.com/Subsea

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.

VideoRay
212 East High Street
Pottstown, PA 19464
Tel: +1 610 458 3000
Fax: +1 610 458 3010
E-mail: sales@videoray.com
Website: www.videoray.com
Contact: Brian Luzzi

With more than 3,000 ROV's in service around the world, VideoRay has clearly become the global leader in Observation ROV technology. VideoRay is an extremely versatile, portable, affordable, and reliable solution for underwater operations including surveys, offshore inspections, search & recovery, homeland & port security, science & research, fish farming, and other unique applications in underwater environments. VideoRay is available on the General Services Administration.

UNDERWATER VIDEO EQUIPMENT

Kongsberg Maritime Ltd.
Campus 1, Aberdeen Innovation Park
Balgownie Road, Bridge of Don
Aberdeen AB22 8GT UK
Tel: +44 (0) 1224 226500
Fax: +44 (0)1224 226501
Email: km.camsales.uk@kongsberg.com
Website: www.km.kongsberg.com/cameras
Contact: Mark Esslemont

Kongsberg Maritime Ltd is a world leader in providing harsh environment underwater camera & imaging technology and marine CCTV systems to the Offshore Oil Field & Renewable Energy, Power Generation, Scientific, Maritime and Military sectors.

ROVSCO, Inc.
5263 Barker Cypress Road, Suite 600
Houston, TX 77084
Tel: +1 281 858 6333
Fax: +1 281 858 6363
E-mail: sales@rovsco.com
Website: www.rovsco.com
Contact: Jessica McKenney

Rovsco provides support and solutions to the offshore subsea and marine industries; work-class ROV and Commercial Diving operations. We manufacture a number of tools/equipment and subsea video items. We have an excellent reputation worldwide based on our product knowledge, dependability, commitment to customer service and speed of response.

SIDUS Solutions, LLC
PO Box 420698
San Diego, CA 92142
Tel. +1 619 275 5533
Fax +1 619 275 5544

P.O. Box 925006
Houston, TX 77292
Tel. +1 281 596 7568
Fax +1 281 596 7578
Email: info@sidus-solutions.com
Web: www.sidus-solutions.com

SIDUS Solutions, LLC is a full service manufacturer offering integrated subsea and hazardous area security & surveillance solutions, from conceptual design through engineering to technical & customer support. Our subsea products are currently operational to depths exceeding 6,500m. Worldwide, SIDUS serves the oil, gas, academic, scientific & military industries.

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Hawboldt Industries
220 Windsor Road
Chester, Nova Scotia
Canada B0J 1J0
Tel: 902 275 3591
Fax: 902 275 5014
E-mail: paul.phillips@hawboldt.ca
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Contact: Paul Phillips

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7266 8th Ave. South
Seattle, WA 98108 USA
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Radoil, Inc.
12251 FM 529
Houston, TX 77041
Tel: +1 713 937 4494
E-mail: pvanderlinden@radoil.com
Website: www.radoil.com

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WINCHES - UNDERWATER

ALL OCEANS Engineering Ltd.
Tyrebagger Works, Clinterty, Kinellar
Aberdeen AB21 0TT, UK
Tel: +44 (0) 1224 791001
Fax: +44 (0) 1224 791002
E-mail: admin@alloceans.co.uk
Website: www.alloceans.co.uk
Contact: Brian Abel

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EvoLogics GmbH
Ackerstrasse 76,
13355 Berlin, Germany

tel.: +49 30 4679 862-0
fax: +49 30 4679 862-01

sales@evologics.de
evologics.de