Ocean News & Technology

January 2016 35 YEARS www.oceannews.com

50th Anniversary of SEALAB II

Feature Story - Page 10

VideoRay

CONFIDENCE UNDERWATER

Your success drives everything we do. That's why we've engineered every aspect of our ROV systems with you in mind. VideoRay offers affordable, reliable, and robust ROV systems that get the job done right the first time. There's a reason why more customers have chosen VideoRay inspection class ROVs than any other ROV solution on the market. From our unparalleled customer service to our innovative training programs, VideoRay gives you confidence underwater.

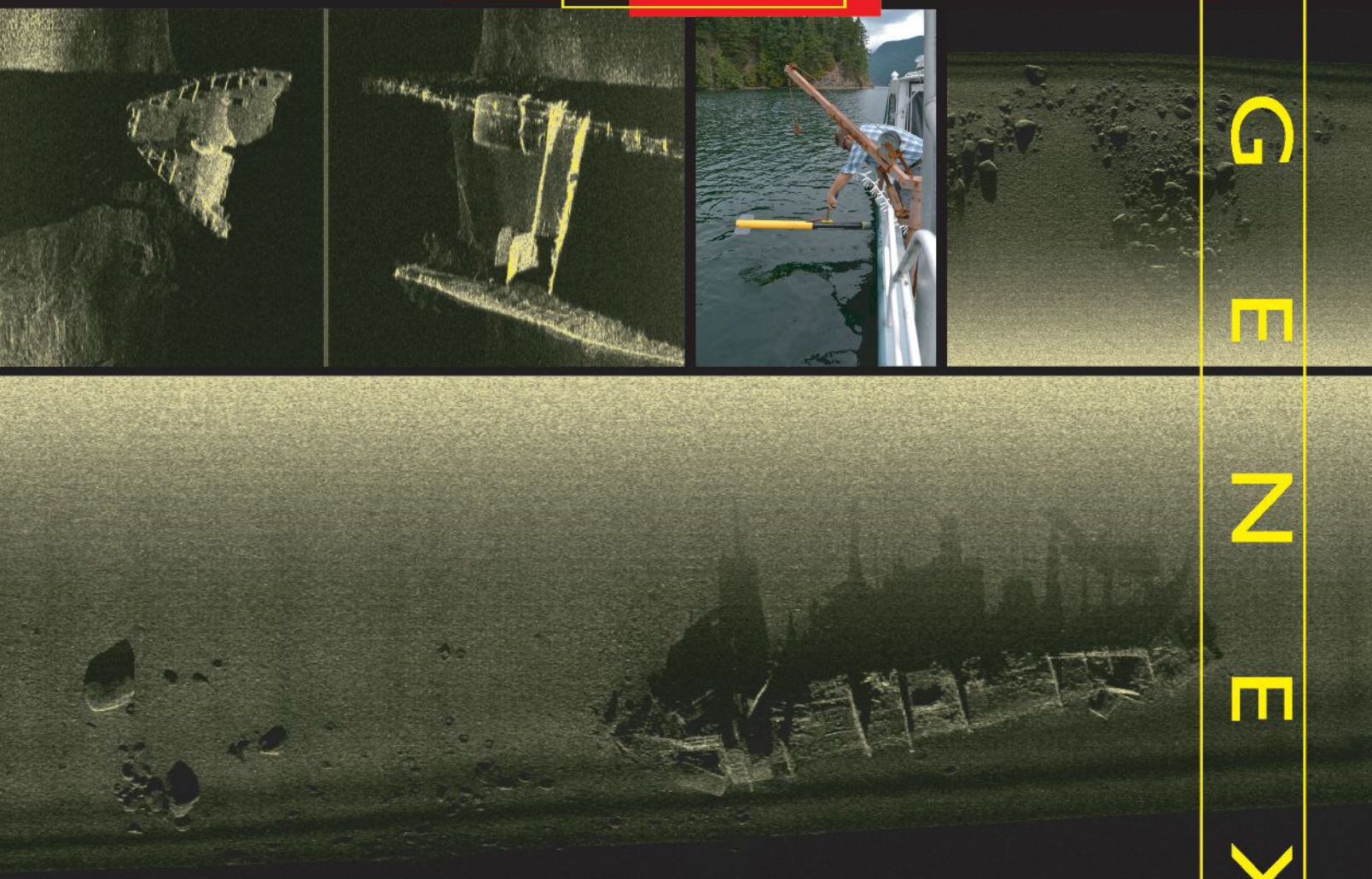
www.videoray.com
©2016 VideoRay LLC

Please visit us at
UI 2016,
Booth #326

Just Arriving...

...New HiRes Sidescans

The Imagenex Model 873
High Resolution Sidescan Sonars



IMAGENEX

IMAGENEX TECHNOLOGY CORP. 209-1875 Broadway Street, Port Coquitlam, BC, V3C 4Z1 Canada
TEL: (604) 944-8248 FAX: (604) 944-8249 e-mail: imagenex@shaw.ca

www.imagenex.com

OPERATIONAL EXPERTISE. GLOBAL REACH. PROFESSIONAL RESULTS.

Our marine services team provides extensive operational experience

GEOPHYSICAL

- Side-scan sonar
- Subbottom profiling
- Bathymetry/single-beam
- Magnetometer capabilities

PHOTODOCUMENTATION

- Diver-held HD video and still camera capabilities
- Self-contained advanced diver navigation systems
- Towed HD video and still cameras
- Ground-truthing services

GEOTECHNICAL

- Vibracoring
- Sediment sampling
- Cone penetration testing

REMOTE SURVEY PLATFORMS

- Unmanned surface vehicles
- ROV systems, including HD cameras
- Wide array aerial survey platforms
- Easy transportation

METOCEAN

- Oceanographic surveys
- Water quality data collection
- Meteorological measurements
- Acoustic Doppler current profiler data collection

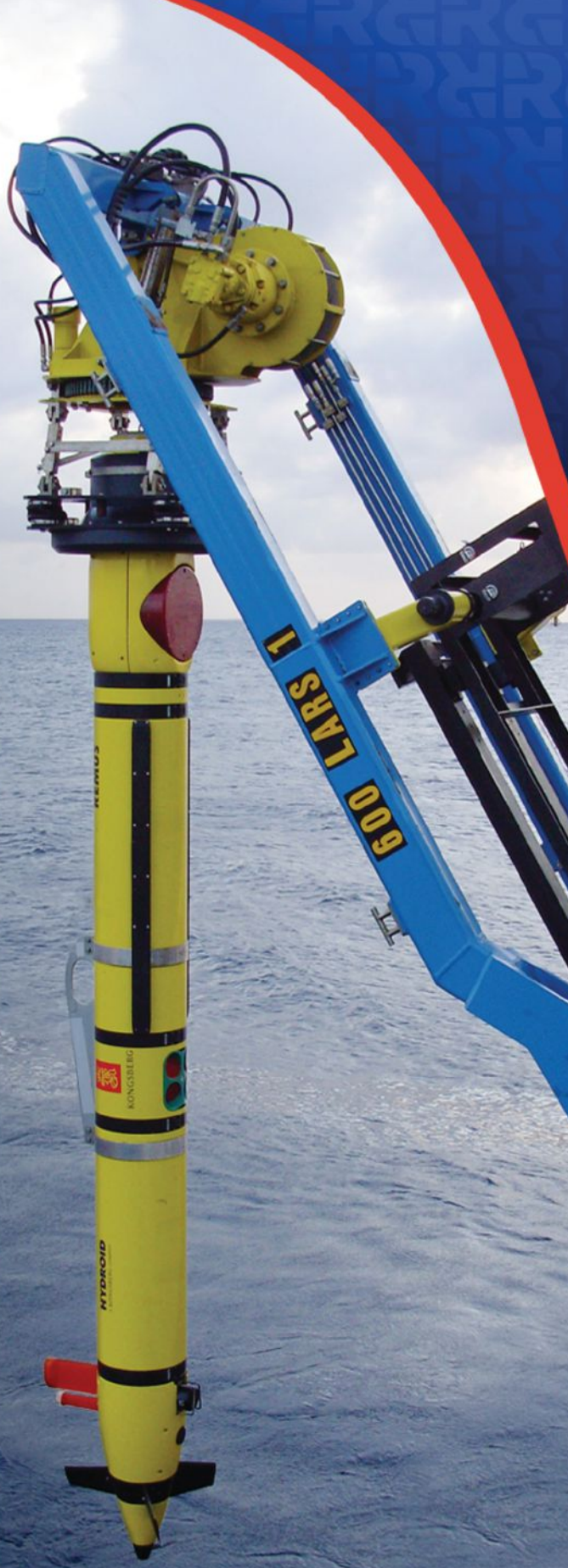
CSA

CSA Ocean Sciences Inc.

FLORIDA | LOUISIANA | TEXAS | CALIFORNIA | TRINIDAD | QATAR | BRAZIL | CYPRUS | SINGAPORE | AUSTRALIA

www.csaocean.com/services

MORE THAN AUVs



IT'S NOT JUST OUR ROBOTS THAT ARE INTELLIGENT

At Hydroid, we design and build a full marine robotics portfolio of products including innovative sub-systems and support technologies.

- Underwater Docking Systems
- Launch & Recovery Systems
- Mission Modules
- Mission-Related Equipment & Software
- Sonar, Tracking & Navigation Systems

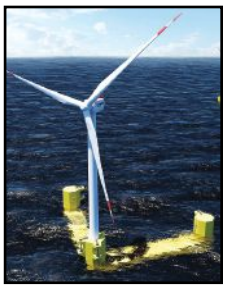
HYDROID
A KONGSBERG COMPANY

Intelligent Marine Robots You Can Rely On

Learn more at www.Hydroid.com

in this issue

Ocean Industry



Offshore Industry

Feature Storys

10 SEALAB II and the Dawn of Saturation Diving

12 USN SUPSALV Certifies Fly-Away Sat Dive System

14 The Evolution of the Aquarius Reef Base Program

16 Students Under the Sea

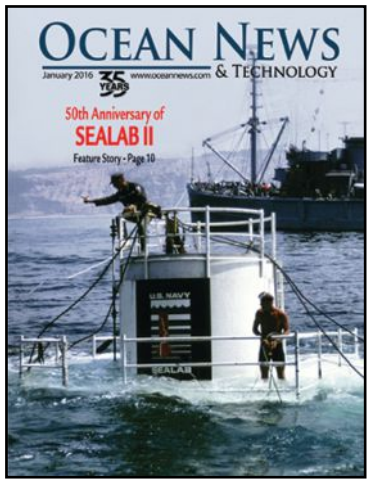
19 Ocean Industry Briefs
22 Maritime Transportation
24 Ocean Science
26 Ocean Energy
30 Defense

33 Offshore Industry Headlines
36 Upstream Oil & Gas
44 Underwater Intervention
50 Maritime Communications
56 Subsea Cables

Departments

8 Editorial
61 Offshore Stats and Data
66 Product News
70 People & Company News
72 Calendar & Events
75 Ocean Industry Directory

Cover Photo



Astronaut/Aquanaut CDR Scott Carpenter, stands atop SEALAB II off the coast of La Jolla, CA on 28 August 1965, directing the deployment operations of the undersea habitat to 205 fsw. A second Aquanaut, believed to be Berry Cannon, stands on the deck assisting in the operation. (Official Photograph, U.S. Navy) (Image scanned from original slide by Brian Hardy. Photoshop by Loralee McAuliffe)

OCEAN NEWS & TECHNOLOGY
www.oceannews.com

More News, More Technology, More Data

in the next issue

Editorial Focus

- Oceanology & Meteorology
- Decommissioning & Abandonment

Product Focus

- Buoys & Monitoring Instrumentation
- Environmental Monitoring/Testing Services

TSC Technology Systems Corp.

Ocean News & Technology ISSN# 1082-6106 is published 12 times a year by Technology Systems Corporation, 7897 SW Jack James Dr., Suite A, Stuart, FL 34997, telephone 772-221-7720.

Copyright ©2016 Technology Systems Corp. All rights to editorial content are reserved. No article, photograph, or illustration may be reproduced in whole or part without the written permission of the publisher. Unless otherwise stated in writing by the contributor, all images submitted to TSC may be used in other promotional materials belonging to TSC without permission.

Subscriptions are free to qualified individuals or companies. For all others, call TSC for subscription information.

Printed in the USA. PRINTED WITH SOY INK

NORTEK DVL
Embed Genius

- Unrivaled Range
- Low Power
- Custom Integration Support

All in the palm of your hand

CURRENT AND WAVE MEASUREMENTS IN THE OCEAN, LAKE AND LABORATORY

NORTEK

Nortek AS
Vangkroken 2
1351 Rud, Norway
Tel: +47 6717 4500
E-mail: inquiry@nortek.no

www.nortek.no/dvl

True innovation makes a difference

EDITORIAL

Manned Submersibles– Looking Ahead

By: William Kohnen
Chair, Manned Underwater Vehicles
Marine Technology Society

OCEAN NEWS & TECHNOLOGY
www.oceannews.com

EDITOR IN CHIEF
Ladd Borne

SUBMARINE CABLE EDITOR
John Manock

PRODUCTION COORDINATOR
Suzanne Short

ART DIRECTOR
Suzanne Short

COPY EDITOR
Robyn Schuricht

CIRCULATION
Jessica Lewis
Jlewis@tscpublishing.com

ADVERTISING SALES

NORTH AMERICAN AD SALES:
Lisa Chilik
Tel: +1 (574) 261 4215
Fax: +1 (574) 255 1006
Lchilik@tscpublishing.com

INTERNATIONAL AD SALES:
Mimi Shipman
Mob: +44 (0) 777 6017 564
Ph: +44 (0) 1460 242 060
mshipman@tscpublishing.com

ADVISORY BOARD

PHILIPPE PIERRE COUSTEAU
Washington, D.C.

KEVIN HARDY
San Diego, California

DR. PHIL HART
Pennington, New Jersey

DAN WHITE
Stuart, Florida

The invention of manned submersibles is directly connected to the spirit of human innovation and exploration. As an industry, the Manned Underwater Vehicle (MUV) umbrella extends over a fantastic spectrum of underwater vessels; from ambient pressure (wet) vehicles with no effective pressure hulls offering amazing ranges of shapes and sizes, to atmospheric vehicles ranging from homemade private projects to deep ocean exploration vehicles and submarines.

Although the commercialization of MUVs is nowhere near the scale of ROVs or AUVs today, it is certain to play a role in future human underwater activity. With that in mind, as MUVs continue to increase their footprint in maritime navigation, they cannot do so through new technology and concepts alone. Their deployment will be impacted by the suitability of local, national and international navigation protocols. Our current protocols are over twenty years old, outdated and not comprehensive enough for industry requirements. True, there are any number of Class society rules for MUV design, construction and fabrication but they generally do not include references for MUV Operations Standards. So, in October 2015, the ASME opened the floor to operational protocols and an ASME PVHO sub-committee has taken-on to explore the issues. The ASME subcommittee objective will be to establish a consensus standard on industry best practices. Through this effort, the goal is to make submersibles easier to deploy, based on recommended standards that can be maintained worldwide as a general navigation circular with better terminology. Why bother? Besides the fact that the system is broken, Homeland Security's increased concerns of ill-intent means that government regulation for submersibles is in the offing, and we aim to be ahead of that curve.

MUV's most notable public presence is through deep ocean research vehicles on the international stage. The U.S. has led this technology with the ALVIN submersible since 1964, with France, Russia and Japan leading deep expeditions for the past 25 years. At the forefront of recent MUV development is China with its 7,000 m rated JIAOLONG submersible, plus many new MUV developments including university research endeavors seeking full ocean depth capabilities. Japan held the historical record for the deepest research submersible (SHINKAI 6500) and deep ocean research remains central to Japan's ocean research. From the commercial sector, there are more than a dozen manufacturers worldwide offering private, luxury/leisure, commercial, tourism and security applications. Large multi-passenger (40-60) vehicles have catered to a well-regulated tourism industry for 30 years. Today, we are experiencing the evolution of a dynamic industry of smaller vehicles, with 1-6 passengers and diving capabilities ranging from 100 to 1,000+ m. These will continue to push deeper as commercial companies cater to a growing luxury market and a trend of privately funded ocean research assets capable of navigating around the globe.

Viewed through the lens of national security, especially in the U.S., the MUV industry has been fortunate, operating for decades in a generally unregulated environment. The question is, what will the next 10-20 years bring? In 1968, the Coast Guard initiated the Underwater Safety Project (USP) which proposed legislation to regulate all nonmilitary submersibles regardless of size, service, or number of passengers. The legislation failed and the MUV industry lives! Today, the political climate might yield a different outcome. The situation is compounded by the activities of many different groups, largely operating as unregulated recreational vehicles. These largely remain on the US Coast Guard radar as an undefined concern. Then there are submersibles for nefarious uses, with clearly defined concerns.

Next Steps? Engaging industry members to work together! We welcome your participation at the first working group session at UI2016 for the MTS MUV annual meeting, in New Orleans 23-25 February, and to attend the next ASME PVHO-1 Meeting in Ventura, California from 8-10 March. We plan to use the U.S. Coast Guard NVIC 5-93 navigation circular as a respected framework to begin our consensus standard. The net result: First, produce an internationally contributed reference to establish MUV operations standards for the various sectors of the MUV industry that could be acceptable to the US Coast Guard, as well as other nations. Second, provide the global insurance industry with a better baseline for underwriting MUV operators. You can follow our progress on the web site, www.mtsmuv.org. Our efforts will keep us on the forefront of innovation, cooperation, and research and diving in rivers, lakes and oceans around the world.

Let's talk Subsea.

In today's challenging environment, you need a partner you can count on.

Forum offers the world's most comprehensive range of remotely operated vehicles used for inspection, survey and deep water construction under the well-known Perry and Sub-Atlantic brands.

Our associated product suite includes LARS, tethering systems, hot stabs, PIG launchers, simulation software, data acquisition softwear and geoscience product management.

Talk to us about our Subsea Technologies at
f-e-t.com/yourforum

OUR SOLUTIONS INCLUDE:

Trenchers
Visualsoft
ROV Tooling
Ovservation ROVs
Work Class ROVs
GEMS
Project Management
VMAX Project Simulation
Buoyancy Foam
Moffat Engineering
LARS and Winches
Equipment Rental

FORUM™

SUBSEA TECHNOLOGIES
everything remotely possible™

To learn more about our products and services, visit us at f-e-t.com/subsea

SEALAB II and the Dawn of Saturation Diving

It was the Fire of Prometheus carried into the sea. A diver descending to great depths to work might actually be able to stay there for days until the work was finished, then pay the decompression penalty just once at the end. Like many great breakthroughs, it was not immediately obvious to seasoned practitioners. Hard-hat diving was just not done that way. There were rules, regulations and procedures to follow, and they were written with good reason.

This issue of **Ocean News & Technology** takes time to honor the talent and tenacity of the men and women who were involved in the U.S. Navy's Man-in-the-Sea program on the occasion of the Golden Anniversary of SEALAB II. The fundamental techniques of saturation diving, along with complementary advances in sub-sea tools and work methods, were successfully demonstrated with the U.S. Navy's SEALAB I and SEALAB II undersea habitats. While SEALAB III ended abruptly, the ambitious goals for that later habitat were attained in the course of time following. That SEALAB III brought a focus of talent to important groundbreaking tasks, and those tasks were ultimately accomplished, confirms its success as well. Other undersea habitats of the day, and indeed the spin-off of commercial diving, were based on the new knowledge and applied techniques that USN Dive Medical Officers Capts. George Bond and Walt Mazzone, along with their team of elite divers discovered, openly shared, and encouraged others, such as Ed Link and Jacques Cousteau, to emulate.

Recent issues of the Journal of Diving History (Historical Diving Society) go into far greater technical detail of SEALAB I and II than possible here. This issue will explore the state-of-the art today, with stories of the Florida International University's Aquarius habitat in the Florida Keys National Marine Sanctuary, the U.S. Navy's new SATFADS system (Saturation Fly Away Diving System), and a final story about a intrepid high school teacher from Stockbridge, Michigan who takes teams of students to stay in the Jules Undersea Lodge, the former La Chalupa undersea habitat.

In looking back we see that the secrets of saturation diving once revealed and understood, were quickly and widely adopted. There were hints and suggestions prior, but saturation diving had its real beginning after-hours and off-the-record with Capt Bond, later affectionately known by his Aquanauts as "Papa Topside," and Capt Mazzone. Author/Historian Ben Hellwarth's excellent narrative, "SEALAB: America's Forgotten Quest to Live and Work on the Ocean Floor" (2012, Simon & Schuster) provides a very readable account drawn on painstaking research and documented details pinned to a timeline.

There was deep sea diving before the U.S. Navy's Man-in-the-Sea program, and a new kind of diving after. It was out of this program that the principles of saturation and mixed gas diving were defined. All commercial sat diving followed for the oil patch, marine archaeology, underwater construction, and even applications in hyperbaric medicine. Classified intelligence missions into foreign seas, later revealed, seemed more like astounding science fiction, than science fact.

The U.S. Navy's SEALAB II undersea habitat on the ways at the San Francisco Bay Naval Shipyard, 1965. Official Photograph, U.S. Navy.

SEALAB II, deployed 28 August through 12 October 1965, was an immensely successful endeavor. SEALAB II achieved the first conversation between an Aquanaut (Scott Carpenter-Team 1) and an Astronaut (Gordon Cooper-Gemini 5), and the first undersea-habitat-to-undersea-habitat conversation between SEALAB II (S. Carpenter) and Cousteau's CONSHELF III (P. Cousteau).

The Naval Undersea Museum in Keyport, Washington writes, "SEALAB I tested and proved the concept of saturation diving, while SEALAB II provided evidence that useful work could be done. The Navy conducted physiological and psychological studies to determine man's effectiveness underwater for an extended period. The divers evaluated the structural engineering of the habitat. They worked on a mock-up of a submarine hull and tested undersea tools; they raised an old navy jet fighter to the surface using a new "Foam-In Salvage" technique; set up a weather station, mined ore samples, experimented with terrestrial plants grown in helium-rich hyperbaric environments, and studied ocean floor geology. They also experimented with "Tuffy", a porpoise trained to do courier work between the habitat and the surface, and to look after free swimming Aquanauts."

In January 1966, seven professional societies, with support from the U.S. Navy's Office of Naval Research and Special Projects Office, collaborated on presenting the symposium, "Man's Extension into the Sea." Its purpose: "to spread before a wide audience, the knowledge and experience gained from SEALAB II and from other recent investigations into man's living and working at considerable depths in the ocean environment."

At that symposium, H. A. O'Neal, Office of Naval Research, provide a summary "OVERVIEW OF SEALAB II." He wrote, in part, "SEALAB II, an undersea laboratory experiment in which we tried to learn more about how man can extend his dominion over the sea.

"In comparison to some fields, conventional diving has progressed slowly for many years-advances have been made, but few radical innovations have appeared. I will mention three innovations of importance:

"(1) The introduction of helium-oxygen diving reduced the danger of nitrogen narcosis (or rapture-of-the-deep) at depths greater than 150 ft and decreased decompression times of deeper dives;

"(2) The second is the introduction of the self-contained-closed circuit-mixed gas breathing apparatus, which increased diver mobility by releasing him from his umbilical cord to the surface; and

"(3) The third is the concept of saturation living introduced by CAPT George F. Bond, MC, USN. This concept greatly increases the ratio of useful working time to decompression time. The reduction of this concept to useful practice is the major subject of this meeting.

"About eight years ago CAPT Bond and his principal collaborators CAPTAINS Workman and Mazzone started laboratory experiments using animals, and later, human volunteer subjects, to determine the effects of living under continuous pressure. These experiments culminated in 1963 with three men living for two weeks in a chamber at a pressure equivalent to 200 fsw.

"In 1964, SEALAB I, an experiment to confirm these laboratory findings in the open ocean, was conducted near Bermuda. It is sufficient to say that the laboratory findings were confirmed, and that this crude precursor experiment identified many crucial areas requiring further work.

"Within five months after the completion of SEALAB I, the framework of the SEALAB II experiment was established. In January, we started assembling the talent required to carry out this experiment--medical officers, physiologists, engineers, chemists, physicists, psychologists, photographers, biologists, master divers, oceanographers, dedicated Aquanauts and many other specialists.

"The major items considered in the planning were:

"PURPOSE - To obtain scientific data on human performance of men living under high-pressure saturation in the open ocean under conditions typical of the continental shelves, and to conduct discrete experiments made possible by this opportunity to place men on the ocean floor for significant periods of time.

"DEPTH - Increased depth was not a primary objective. A major consideration was availability of a significant depth range in a small area for excursion diving to at least two atmospheres (66 ft) greater than habitat depth. A site on the southeast edge of Scripps Canyon, about 3,000 ft from the end of the pier of Scripps Institution of Oceanography (La Jolla, CA) was selected.

"The many groups went to work, and, in August we were on site with the SEALAB II full installation, including the SEALAB II seafloor habitat itself, the surface support vessel Berkone, PTC, diving bell, communications, power and water lines to shore, the Scripps' Benthic Lab, and numerous experiments.

"On 28 August, just eight days later than the date we had projected in January, the first team entered the habitat. On 12 October, the last team completed decompression. Between these dates over 10,000 man-hours had been spent at 200-ft depth and over 500 man-hours had been spent swimming and working.

"The comprehensive research program included Medical, Physiological and human performance studies of the Aquanauts, Environmental Sciences, and Salvage and Tool Test Program. The latter included "Foam-in-Salvage", a stud gun, collapsible salvage pontoons, zero-reaction drill and hole cutter, and an experimental suction mining device.

"From this experiment we have learned:

"1. Reasonably large groups of men can live for protracted periods (15 to 30 days) at 205 ft, have a large degree of autonomy, accomplish useful work, be safely decompressed and show no apparent serious adverse physiological or psychological effects.

"2. The U. S. Navy's first experience with no decompression excursion dives from a starting depth of 205 ft in a saturated state to a depth of 266 and 300 ft were successful. This represents an important addition to undersea diving technology.

"3. There is a clear degree of diver adaptation to cold water as shown by interviews with the Aquanauts and by pre and post cold-water emersion physiological measurements.

"4. Adequate protection against cold water can be obtained for extended periods by the use of heated suits. Swimmers without supplementally heated wetsuits are limited to less than one hour of useful work in 47°-54°F waters.

"5. A degradation of work capability varying between 17% and 37% as compared to warm to shallow water capability occurs which is the result of a multiplicity of environmental and psychological stress factors.

"6. Improved tools and techniques show promise for salvage and other undersea work functions.

"7. Based on the analysis of the overall performance of the Aquanauts, criteria can be developed for the selection of future Aquanauts.

"8. The interaction between man and porpoise has shown that to depths of 200 ft the porpoise can be extremely useful to man-in-the-sea operations.

"9. In-situ living offers a new and important methodology to scientific, biological, geological ocean floor investigations.

"10. Although vastly improved over SEALAB I, the habitat and much of the diving equipment are still rudimentary and require extensive development to enable routine operations.

"11. Deep-water swimmer communications and ocean floor navigation systems require an immediate effort to obtain acceptable equipment for future man-in-the-sea operations.

"12. A completely autonomous habitat is awaiting the development of reliable underwater power package and integrated complete life support systems.

"In summary, a step forward has been made in enabling man to move with greater ease in a hostile environment, and has shown those problem areas which must receive attention to permit him to work and live more easily, safely, and efficiently. "

USN SUPSALV Certifies Fly-Away Sat Dive System

The Navy Saturation Fly Away Dive System, SAT FADS, is maintained as a NAVSEA 00C asset used primarily for deep ocean salvage and submarine recovery operations, but is also certified for use inshore. The system was developed and is retained to meet a CNO directive to "maintain a saturation diving capability in the U.S. Navy". To meet this directive 00C routinely assembles a team of Saturation Divers, military and government civilian, from various NAVSEA and Fleet commands to man and operate the system. Unique about this program is that the system is operated as a hybrid operation manning the system with half military saturation divers and half civilian government saturation divers. The government divers are all retired navy saturation divers who bring years of operational saturation diving experience to the team.

1,000 fsw Open Ocean Saturation Dives

On 11 May 2012, a few miles off Panama City, Florida, a diving bell containing three divers from the U.S. Navy Experimental Diving Unit descended slowly and steadily into black water of the Gulf of Mexico far below the depth that sunlight can reach.

Increasing water pressure compressed the air inside the diving bell, which was open to the sea, so more air was released into the bell to keep the volume of air constant and prevent seawater from entering. As the increasing pressure raised the saturation point of the diver's bodies, their tissue absorbed additional gases from the air. Therefore, the mixture of gases within the capsule's air required alteration during the descent to maintain the optimal mix for working at depth.

Finally, the divers reached their goal of 1,000-ft, a depth that no U.S. Navy diver had attained in an open diving bell since the 1970s. One by one, they left the confines of the bell and took up positions on a diving stage already positioned at the target depth. "We made it!" one of them exclaimed over a voice link to their support team on the surface far above. The last time U.S. Navy personnel had reached comparable depth in an open bell was in 1975, when a two-man team performed a saturation dive to 1,148 ft with the MK 1 Deep Diving System.

Another three-man team from the Experimental Diving Unit also completed a dive to the target depth. One of the teams conducted excursions from the bell at 1,001 "ft of salt water" (FSW), and the other at 1,004 FSW. These successful dives enabled NAVSEA's Supervisor of Salvage and Diving (SUPSALV) to certify the Navy's new Saturation (SAT) Fly Away Diving System (FADS) to 1,000 FSW, reestablishing an important capability the Navy has not had for decades.

The SAT FADS system on Seneca Lake, which includes the bell and umbilical hoses to the left, handling system (crane) holding the bell, command and control system, lockout chamber, and living quarters. Official Photograph, U.S. Navy.

470 ffw Saturation Dives in New York Finger Lakes

NAVSEA 00C completed SAT FADs Mission 14-01, Seneca Lake 450, at the NUWC Newport Seneca Lake Sonar Test Facility in July 2014. U.S. Navy Divers performed a 10-day saturation diving mission in 470 ft on the deepest of the Finger Lakes in upstate New York.

This mission began when the SAT FADS team broke down and shipped the Saturation Fly Away Diving System (SAT FADS) to NUWC Newport's Seneca Lake Sonar Test Facility in Dresden NY. After receiving and offloading 14 semi-trucks, the team set up the SAT FADS system on a barge and began post-transportation system maintenance and testing. Diver and operator training came next. Finally, the dive system was ready for manned operations.

SAT FADS system installed on the barge in Seneca Lake, NY. Official Photograph, U.S. Navy.

After successfully completing a 450 ft unmanned bell dive the Navy divers were cleared to go. The barge was moored about one-half mile into the lake alongside NUWC's Systems Measurement Platform (SMP). On 1 October, the team conducted the first manned bell dive to 470 ffw (ft, freshwater). The bell was deployed for nine hours. The divers completed five hours of bottom time working from the deployed bell. During this time the divers completed the first phase of a detailed bottom survey and validated the dressing procedures for the new contaminated water diving suit. On the second day, the team conducted two bell excursions completing the detailed bottom survey and recovering targeted objects from the bottom for the NUWC test facility.

On 3 October, the divers completed their forth bell excursion to 470 ffw where they located and detached a clump weight assembly from a sensitive fiber optic array for the NUCW facility which will allow them to recover the expensive array without damaging the array. Additionally there was one more contaminated water diving suit procedure validation completed during the diving excursions. The bell was recovered to the surface and the barge began its move back to shore on

Saturation dives being monitored topside in the Control Module Official Photograph, U.S. Navy.

Saturday where the divers completed 4 days of decompression. Divers remained in the deck decompression chamber until the decompression period was complete on 8 October.

This successful operation supported the following goals:

• Continued the training and qualification of existing and new Navy Saturation divers required to meet a CNO directive to maintain a saturation diving capability in the US Navy.

• Conduct open water bell diving phase of the contaminated water dive suit R&D effort.

• Prove transportability over highways of the SAT FADS for rapid mobilization.

• Conduct detailed bottom survey of the underwater test site for the NUWC Newport engineers.

• Disconnect clump weight from underwater array for NUWC Newport test facility.

• Recover targeted objects from the bottom as required by the NUWC Newport Test Facility staff.

The following commands supported the operation with divers, technicians, and or logistics support:

• SEA 00C: Detachment OIC, (numerous Diving and Certification engineers)

• Ultimate Engineering, (SAT FADS ISEA): 4 Saturation Technicians, 1 engineer

• NUWC Keyport: 2 Government Saturation Divers

• NSWC PC: 1 Government Saturation Diver

• PSNS: 2 Government Saturation Divers

• NEDU: 5 Navy Saturation Divers, 2 Government Saturation Divers, 1 Diving Officer

• SRDD: 9 Navy Divers

• GITMO Dive Locker: 1 Navy Saturation Diver

• SDVT-1: One Navy Saturation Diver

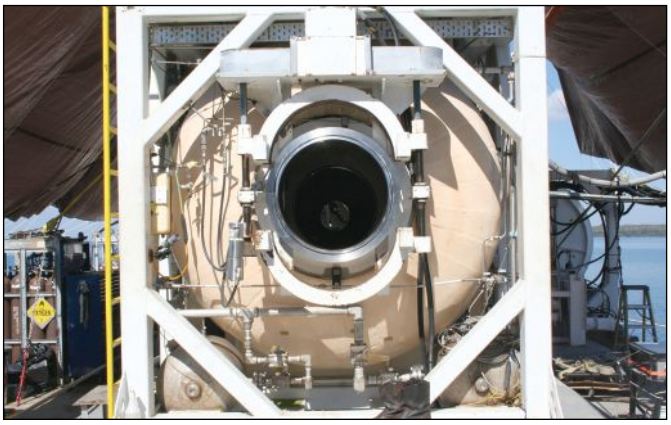
• NUWC Newport Seneca Lake

The process of bringing an approved open-water diving system back to the Navy began in 2003, when OPNAV's Submarine Warfare Division (N87) proposed an acquisition program for SAT FADS and gained approval from the Chief of Naval Operations. "Bringing SAT FADS back to the Navy was essential to support the full range of Navy salvage and recovery operations," said Michael Dean, SUPSALV's deputy director. "Those operations include crisis response from emergent causalities, as well as planned response in and around the world's littorals and continental shelves."

"SAT FADS provides the ability for Navy divers to work underwater longer, at greater depths, while avoiding large in-water decompression penalties," Dean noted. "The saturation diving technique allows divers to postpone the lengthy decompression process until the completion of the mission when they can be safely decompressed in an on-deck recompression chamber."

SAT FADS measures just 40 ft by 80 ft. It includes the deck decompression chamber—which serves as pressurized living quarters for the divers during an operation—the manned dive bell, a handling system, a command and control center, two auxiliary support equipment containers, and storage racks for bulk helium and oxygen. The entire system is air-transportable, so it can be rapidly transported anywhere in the world and loaded onto any suitable vessel of opportunity to conduct diving operations.

SAT FADS is designed to support six divers working on the ocean floor at a depth of 1,000 ft for up to 21 days, with an additional nine days of decompression. This capability makes it possible to support deep aircraft and ship recovery, or salvage operations. Three divers working in a team can work up to eight hours a day from SAT FADS during an operation, with another three-man team aboard the unit able to rotate in and continue work with minimal interruption until the job is completed.



The SAT FADS system on Seneca Lake, showing the DDC mating collar that connects to the bell. Official Photograph, U.S. Navy.

The new system surpasses the capability that was provided by the Navy's last saturated diving platforms, the two decommissioned Pigeon-class submarine rescue vessels. These two dedicated vessels, decommissioned over a decade ago, allowed divers to operate only to a maximum depth of 850 ft, as compared to 1,000 ft for the new system. Air-portability makes the new system far more mobile and responsive. SAT FADS provides all this capability for a fraction of the total ownership cost of any previous ship-based saturated diving system.

"This system increases the Navy's salvage and diving capabilities, allowing us to put U.S. Navy saturation divers to greater ocean depths than previously attainable," said Paul McMurtrie, a retired Navy master diver now serving as the SAT FADS program manager. "This new asset will greatly increase our manned diving capabilities, as well as provide a one-of-a-kind training asset for future Navy saturation divers."

"Having SAT FADS back in the Navy is very beneficial to the Navy diving community," said Cmdr. Mark Matthews, SUPSALV's director. "These are exciting times for the diving community, as we no longer have to wait for commercially available SAT systems in times of need, [and] we also can begin training other divers on our newly approved system."

Acknowledgements:

This article is dedicated to the original U.S. Navy Man-in-the-Sea Aquanauts on the occasion of the U.S. Navy's SEALAB II 50th Anniversary celebrations. These men are known and recognized as the pioneers of saturation diving and its many applications. U.S. Navy Divers Fernando Lugo and Don Risk made the first saturation dive to 1,025-fsw in February 1968 in chambers at the Washington Navy Yard, and were later assigned to operations of SEALAB III. The authors also thank Kevin Hardy, Global Ocean Design, for his help and encouragement to write this article.

The Evolution of the Aquarius Reef Base Program

Brief History

The Aquarius undersea laboratory remains the world's last operational saturation diving facility specifically designed and dedicated to scientific research and education in the sea. Aquarius not only represents an extensive history of humans living underwater (Vorosmarti, 1997), but also continues to evolve to capitalize on opportunities.

Funded by NOAA's National Undersea Research Program (NURP) in the mid 1980s to replace the successful Hydrolab, Aquarius was deployed in the Hydrolab footprint in Salt River Canyon off St. Croix USVI (Kesling and Berey, 1989). Thirteen missions were conducted before Hurricane Hugo devastated the island on 17 September 1989.

The NURP Center at the University of North Carolina Wilmington (UNCW) retrieved the Aquarius from the seafloor in 1990. Following a three-year refurbishment, the habitat was redeployed at Conch Reef in the Florida Keys National Marine Sanctuary in 1993.

After refit in 1996-1997 that included replacing the manned Mobile Support Barge with an unmanned Life Support Buoy (LSB), Aquarius resumed operations in 1998. The operational capabilities and scientific value of studies conducted through 2001 have been well documented in Miller and Cooper (2001) and Miller (1996).

Image 1: Aquarius undersea laboratory. Photo credit: DJ Roller, Liquid Pictures.

In 2001, Aquarius capitalized on infrastructure upgrades, which included real-time Internet and telepresence capabilities, to expand its operations beyond supporting coral and marine ecosystem research and education. Partnerships with NASA, recently completing its 20th Extreme Environment Mission Operations mission, utilize Aquarius for space analogue research (Trembanis, 2012; Doran et al., 2009; Zwart et al., 2009; Todd and Reagan, 2004). Similarly, the U.S. Navy has leased Aquarius since 2003 as an extension of their saturation training diving operations. In 2014, Fabien Cousteau partnered with Florida International University (FIU) to conduct Mission-31, one of the most extensive education and outreach missions conducted aboard Aquarius to date (Woods, 2014).

As described in Kohanowich and Potts (2010), Aquarius evolved into service as a National asset with five mission pillars: marine ecosystem research, coral reef observation and sentinel site, advanced undersea technology development, national training, and outreach and education. These mission objectives remain in effect today (Figure 1).

Figure 1. ***Aquarius Reef Base mission pillars.***

In 2012, NOAA began the process of defunding Aquarius and UNCW relinquished its role as the program's host academic institution. Florida International University (FIU) seized the opportunity to take control of a national asset and in 2013 became the operator of Aquarius (Adkins, 2014; Potts, 2013; Renaud, 2013). FIU has a long history of research in the coastal marine environment in south Florida, and it counts former Aquarius aquanauts on its faculty. Aquarius serves as the cornerstone of the university's Marine Education and Research Initiative for the Florida Keys and a generous philanthropic investment secured the purchase of a new shore base in Islamorada, Florida.

With an innovative business plan, FIU continued to build upon the five mission pillars by working with partners that pay a day-rate for access to Aquarius and other program assets. NOAA endorsed this vision and the ensuing partnership resulted in a successful transfer of ownership from NOAA to FIU in November 2014.

Aquarius Reef Base Innovation Plan: 2013-2019

Aquarius, combined with the LSB moored overhead, a fleet of vessels and a shore base command and productions center, collectively form the Aquarius Reef Base (ARB) program. The Aquarius Reef Base strengthens FIU's strategic goals in the Florida Keys to bring the services of a large research university to enhance educational, cultural and research opportunities to the local community. This facility augments the already considerable research programs of FIU faculty in the Keys and provides innovative opportunities to teach classes and offer programs that take advantage of ARB assets.

An innovation plan was developed in 2013 and serves as a roadmap to transition ARB from a federally funded program to a self-sustaining, pay-for-use asset and service provider. The innovation plan builds upon the mission pillars while systematically seeking to broaden the customer base, diversifying revenue streams, retaining a competitive advantage and capitalizing on exponential crowd tools to explore next generation habitat improvements.

Overarching innovation plan programmatic and business goals:

- Advance discovery and accelerate innovation by providing scientists with an unparalleled platform to live, train and work underwater.
- Support management driven marine ecosystem science projects.
- Accelerate innovation by providing scientists and engineers with a stable and continuous power supply and real-time data streaming capabilities.
- Spark creativity, curiosity and imagination of students by providing immersive programs that enhance STEAM curricula.
- Engage citizen scientists through experiential programs that increase awareness and drive residual income.

Image 2: NASA Extreme Environment Mission Operations. Photo credit: DJ Roller, Liquid Pictures.

• Capitalize on the marketing potential of the ARB brand through merchandising and corporate sponsorship.

Aquarius Reef Base is adding value to current and potential customers through a series of incremental and iterative capability enhancements:

• Reinstallation of the Aquarius Conch Reef Observation Station to provide continual, real-time oceanographic monitoring capabilities; optimally, this network will include plug-and-play nodes for project-specific sensor research and development.

• Enhanced, scalable IT infrastructure to provide capacity for next-stage interactive programming from Aquarius, such as virtual and augmented reality programming.

• Expanded suite of professional training programs offered at ARB.

• Citizen science programs developed both internally and through extramural partnerships to take advantage of Aquarius' unique ability to capture the imagination of the public and focus their interests in science, technology and conservation issues.

In 2016, the program will celebrate its 23rd anniversary of the Aquarius undersea habitat's deployment on Conch Reef. To date, the program has hosted 127 missions since its initial deployment in 1993.

The Future: Aquarius 2020

Aquarius is annually certified by the American Bureau of Shipping and can remain in service for the foreseeable future with consistent maintenance and component replacement that can be conducted while the habitat remains on the bottom (e.g., viewport replacement). As we look to 2020 and beyond, FIU begins to consider options for the next generation of saturation capability.

Design and construction of the next generation Aquarius Reef Base will take considerable intellectual and financial capital. Fortunately, we live in a collaborative economy where technology is accelerating exponentially and crowdsourcing is becoming a staple in product and service development (Rodriguez, 2014). By harnessing the genius of a passionate, hyperconnected crowd, we can begin to realistically look to the future.

Image 3: Dynamic energy budget study for giant barrel sponge Xestospongia muta. Photo credit: DJ Roller, Liquid Pictures.

Funding such an endeavor will require a cooperative approach that includes corporate investment and sponsorship, philanthropic support and industry use commitment.

Acknowledgements:

This article is dedicated to the original U.S. Navy Man-in-the-Sea Aquanauts on the occasion of the U.S. Navy's SEALAB II 50th Anniversary celebrations. These men are known and recognized as the pioneers of saturation diving and its many applications. The author also thanks Kevin Hardy, Global Ocean Design, for his help and encouragement to write this article.

Literature Cited:

Adkins, J. 2014. Saving Aquarius. FIU Magazine, 04/23/2014. http://news.fiu.edu/2014/04/saving-aquarius-reef-base-the-worlds-only-underwater-ocean-laboratory/76146

Doran, C.R., M. Anvari, T. Low and M.D. Broderick. 2009. Evaluation of teleoperated surgical robots in an enclosed undersea environment. Telemedicine and E-Health, 15(4): 325-335.

Kesling, D., and R. Berey. 1989. Training, equipment, and operational procedures for conducting scientific saturation diving activities. In: Diving for Science, Proc. of the 9th Annual American Academy of Underwater Sciences Diving Symposium. Lang M.A. ed., Woods Hole, MA., 199 211.

Kohanowich, K.M. and T.A. Potts. 2010. NOAA's Aquarius Reef Base: Entering a New Decade. 29th AAUS scientific symposium, March 25-27, 2010, Waikiki, HI.

Miller, S.L. and C. Cooper. 2001. The Aquarius underwater laboratory: America's "inner space" station. MTS Journal 34(4): 69-74.

Miller, S.L. 1996. How an underwater habitat benefits marine science. Scientific American, October 1996.

Potts, T.A. 2013. "Aquarius Lives On." Alert Diver: The Magazine of the Divers Alert Network. Spring 2013

Renaud, J.P. 2013. FIU to operate Aquarius Reef Base. FIU News, 01/15/2013. http://news.fiu.edu/2013/01/fiu-to-operate-aquarius-reef-base/50646

Rodriguez, G. 2014. The exponential enterprise: Your most feared competitor now has a name. Forbes, October 31, 2014. http://www.forbes.com/sites/giovannirodriguez/2014/10/31/the-exponential-enterprise-your-most-feared-competitor-now-has-a-name/

Shepard, A.N., D.A. Dinsmore, S.L. Miller, C.B. Cooper and R. Wicklund. 1996. Aquarius Undersea Laboratory: The Next Generation. In: Lang, MA, Baldwin, CC, eds. Methods and Techniques of Underwater Research 1996; Proceedings of the American Academy of Underwater Sciences 1996 Scientific Symposium. Smithsonian Institution, Washington, D.C.

Todd, W. and M. Reagan. 2003. The NEEMO Project: A report on how NASA utilizes the Aquarius undersea habitat as an analog for long-duration space flight. Habitation Conference 2004; 4-7 Jan. 2004; Orlando, FL; United States, 11pp.

Trembanis, A.C., A. Forrest, D.C. Miller, D.S. Lim, M.L. Gernhardt and W.L. Todd. 2012. Multiplatform ocean exploration: Insights from the NEEMO space analog mission. MTS Journal, 46(4): 7-19.

Vorosmarti, J. A very short history of saturation diving. Historical Diving Times, Issue 20, Winter 1997.

Woods, J.D. 2014. 63 Feet under the sea. Time Magazine, July 21, 2014, pp: 40-43.

Zwart, S.R., G. Kala and S.M. Smith. 2009. Body iron stores and oxidative damage in humans increased during and after a 10-to-12 day undersea dive. Journal of Nutrition, 139(1): 90-95.

STUDENTS UNDER THE SEA: Stockbridge High School Students bring memories of the Navy's Man-in-the-Sea Project to a new generation of explorers

Growing up in the sixties and seventies, I was always amazed by the adventure, exploration and scientific discoveries of the time, from the Mercury, Gemini and Apollo programs of NASA, to the programs that followed, the Skylab and the Space Shuttle. While we began to explore space, we were also exploring our oceans.

The Navy Man-in-the-Sea program, Project Genesis and SEALAB, Tektite as well as the exploits of Jacques Cousteau filled by mind with wonder and a sense of adventure. The desire to learn and explore. To find something new. To experience what it was like to be a Lewis and Clark or a Cousteau. The later exploits of Robert Ballard and James Cameron served to fuel my imagination. As I began my teaching career, I hoped to instill this sense of wonder in my students.

In the spring of 2013 I read the book "SEALAB, America's Forgotten Quest to Live and Work on the Ocean Floor," by Ben Hellwarth. After reading the book, I searched for a way to use it in my underwater robotics class. I felt that living and working underwater would bring the same inspiration and awareness to my students that learning to scuba dive had brought me.

Planning the Adventure

In the spring of 2014 I wrote and received two grants that would start the project. The first grant from the Michigan STEM Partnership provided the funds necessary to provide PADI Open Water SCUBA Certification for 11 students. A second grant from the Jackson Community Foundation provided initial funding for my students stay in the Jules Undersea Lodge and PADI Aquanaut Certification.

During the 2014/2015 school year I had one class section of underwater robotics paired with a section of Advanced Placement (AP) Biology. Our AP Biology class, taught by my colleague, Jeff Trapp, travels to the Marine Resources Development Foundation's Marine Lab each session to participate in a four day Coastal Marine Ecology of the Florida Keys. My underwater robotics students' would extend this trip by four days to stay in the Jules Undersea Lodge for 24 hours and obtain the Aquanaut Certification. This project has been continued into the 2015/2016 school year with our second group of newly minted aquanauts.

Engaging younger students through an Ambassadorship Program

With a plan in place for my high school students, I also wanted a way to engage younger students in our school district. Since the inception of our underwater robotics program in 2010, I have made it a point to try to engage at least 100 elementary and middle school students in each of our projects in some way. We call this our "Ambassadorship Program." This has also served as a tool to recruit future students into my high school robotics classes which are offered as electives in the curriculum.

Inspiration for our "Ambassadorship Program" project came from Kevin Hardy, founder of Global Ocean Design. I first met Kevin at Ocean's 2014 MTS-IEEE conference in St. Johns Newfoundland, Canada, where we were both giving presentations. After explaining my plan to take my students to Key Largo and train as Aquanauts to Kevin, he shared a project and lesson plan with me. The project, "Atlantis: The Lost Island," involves students building a simulated underwater habitat or terrarium where students place terrestrial plant life in a submerged terrarium for a week's duration. An upside down mason jar holds air in and water out, legs connect to a metal plate loaded with lead tire weights hidden below the sand, an aquarium air pump pushes fresh air in, while excess air bubbles out through a second straw tube on the opposite side. Detailed project course notes are described in the course guide "Atlantis: The Lost Island", and "MouseHouse", at www.globaloceandesign.com/atlantis_mousehouse.

Heritage Intermediate School students observing their underwater terrariums or simulated "Underwater Habitat."

Pre dive preparation

"At the beginning of the school year when Mr. Richards said we were going to stay in the Jules Underwater Sea Lodge, I didn't know much about it or the concept of it," recalls high school senior Jamie Cool.

In addition to staying in the Jules Undersea Lodge, we planned on collaborating with younger students at Smith Elementary Schools (grades K-3) and at Heritage Intermediate School (grades 4-7) by Skyping with them while staying underwater. In order for the younger students to understand the concepts involved in humans living in an undersea structure, we recreated the Atlantis: The Lost Island project. The team selected to stay in the Jules Undersea Lodge, now consisting of six high school students and I, wanted to share our project with younger students in a meaningful way. About a week before we departed for Key Largo, we traveled to Smith Elementary School and Heritage Intermediate School and created our version of the Atlantis: The Lost Island Project. Using inexpensive materials already available in our robotics lab we helped the younger students' make 10 underwater terrariums. Each contained a small terrestrial plant. The students' goal was to keep the plants alive and collect data on how well the plants grew and thrived over the next month. My high school students also briefed the Smith and Heritage students on our project in the Jules Undersea Lodge.

By: Bob Richards
Business and Technology Teacher
Stockbridge High School, Stockbridge, MI

Overall, I feel that this project helped the younger students understand how the Undersea Lodge functioned. It also helped the high school students better understand the science and engineering concepts. According to Jamie Cool, "When we used the analogy that the jar was the lodge and the plant represented a human that it really clicked for them."

The Atlantis: The Lost Island project made it easier for all the students involved in this project to understand but also helped us have better knowledge about the lodge we were going to be living in. We then made plans to connect with the Smith and Heritage students via the internet while we were living in the Jules Undersea Lodge.

Living and working underwater

On February 12th, six students from the Stockbridge Robotics Program strapped on their scuba tanks and dove 25 ft below surface into the Jules Undersea Lodge in Key Largo, Florida. The lodge is also neighbored by the underwater MarineLab, a smaller structure, where scientists regularly work and stay. These students had the opportunity to stay underwater for 24 hours to become certified aquanauts, visit MarineLab, and Skype back to their hometown.

Second grade students from Mrs. Whitt's classroom at Smith Elementary School conducting a Skype Session with Stockbridge High School students working in the Jules Undersea Lodge.

These six female students were each a member of a new team in the Robotics Program that focused on building remote camera systems. These systems were to be tested in Key Largo, but the end goal is to utilize these systems in the Great Lakes to monitor various fish. The camera systems are made to be anchored to the ocean floor and take time-lapse photography for up to five days. The students tested the systems in multiple places around the lodge for 24 hours.

The students were also able to conduct a Google Hangout with 60 elementary students in Stockbridge to show them the lodge and let them drive a VideoRay ROV via the Internet. The elementary students also learned how the underwater habitat worked by building their own mini habitat and growing a plant in it. The students also talked to NPR and Channel 10 News while underwater.

High school students conducted a Google Hangout with 60 students from Stockbridge's Smith Elementary School, Heritage Intermediate School and WKAR reporter Kevin Lavery.

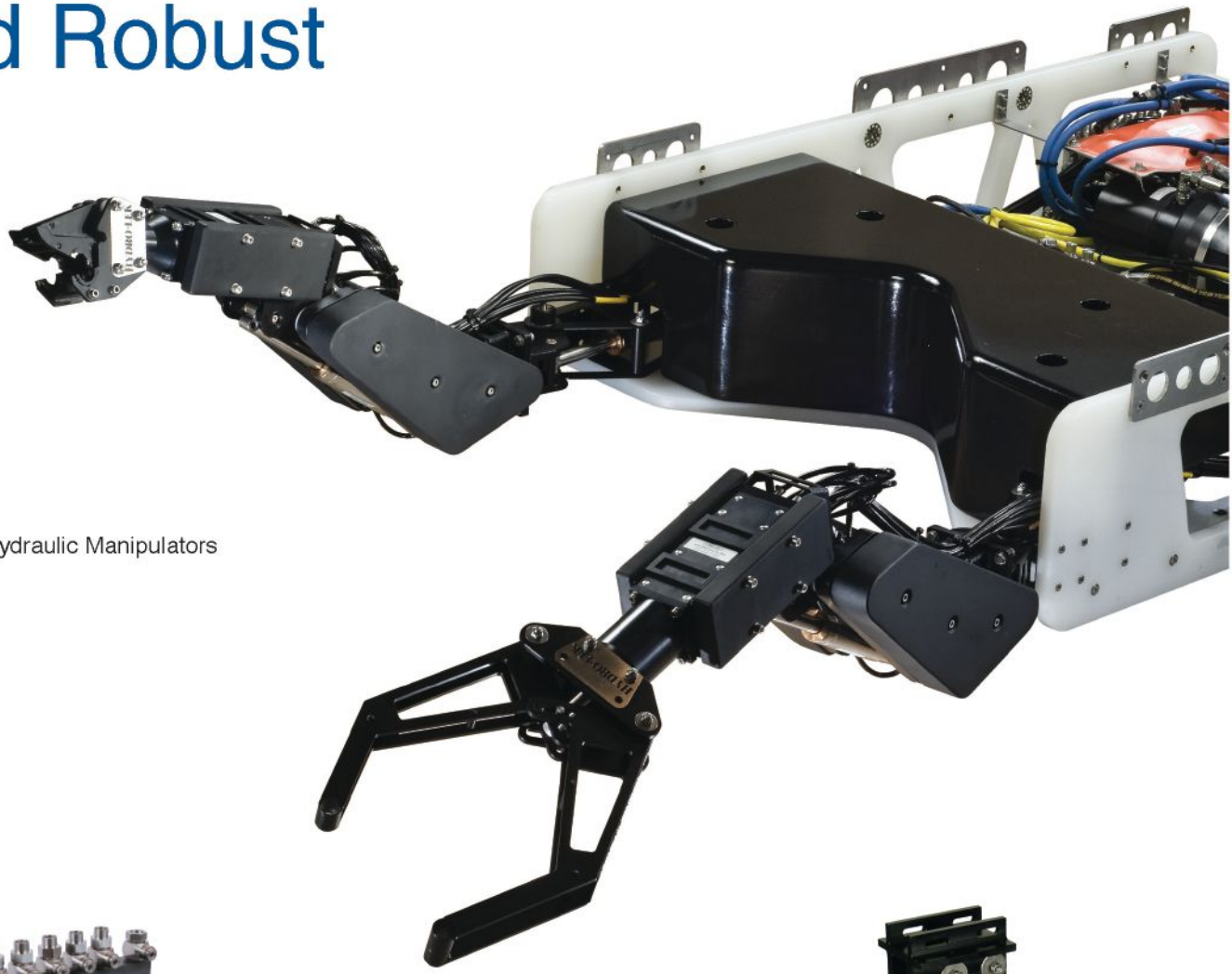
Staying underwater for 24 hours and completing training has allowed each of the six students to become certified aquanauts. The students traveled between the MarineLab and Jules Undersea Lodge during their stay. While in the MarineLab, they were able to see the research done there, drive the VideoRay ROV, and sit in the observation bubble underneath the lab.

High student Chloe Hypes working with Heritage Intermediate School students on their Project Atlantis underwater habitats.

Program Expansion

Based upon the success of the February 2015 project the program was continued and expanded in the fall of 2015. A new class of eleven students traveled to Key Largo, Florida in early December 2015 for Aquanaut training and the number of students reached by our Ambassadorship program also increased. This project, has inspired, engaged and educated students while providing them with experiential learning activities designed to increase the number of students participating in programs that are likely to encourage them to consider STEM careers.

Simple, Compact and Robust



Hydraulic Manipulators

New 7-Function Valve Pack

Hydraulic Cylinders

Pan & Tilt Units

Subsea Tooling and Components

Tel: +44 (0) 118 9736903
Email: enquiries@hydro-lek.com
www.hydro-lek.com

HYDRO-LEK
REMOTE HANDLING SPECIALISTS
A SAAB SEAEYE COMPANY

OCEAN INDUSTRY

in this section

Ocean Industry Briefs 19
Maritime Transportation 22
Ocean Science 24
Ocean Energy 26
Defense 30

Greek survey uncovers significant underwater antiquities

Ship's wheel from a surveyed historic shipwreck off Methoni
Photo credit: Greek Ministry of Culture and Sports.

A team of marine geophysicists from the Laboratory of Marine Geology and Physical Oceanography at the University of Patras has completed a marine geophysical and hydrographic survey off Methoni, Greece. The survey was conducted under the auspices of the Greek Ephorate of Underwater Antiquities (Ministry of Culture and Sports), with support from Kongsberg Maritime.

The extensive geoarchaeological survey, which was undertaken within the Evolved GE.N.ESIS (A marine GEophysical investigatioN for marine knowledge and the anthESIS of Methoni) project, brought to light significant underwater antiquities while promoting regional sustainable growth. A number of historical shipwrecks, the town's ancient submerged pier and harbor, and ruins of the submerged prehistoric town were mapped in 2D and 3D with the use of KONGSBERG hydrographic and geophysical instrumentation.

The aim of the GE.N.ESIS project is to highlight the Blue Growth potential in the Methoni coast and to promote the protection of the local marine environment. The project outcomes are expected to highlight underwater resources that have the potential of being drivers for sustainable growth with special focus on the local underwater cultural heritage resources.

Regional physical processes, sensitive seabed habitats and development of the underwater environment through the millennia are also being studied. The identified synergies and conflicts between the underwater cultural heritage resources, local underwater environment, physical processes and human activities are expected to indicate the sustainable growth potential of the area, the environmental challenges and ultimately the necessity for implementation of an Integrated Maritime Policy.

The research team used the Kongsberg GeoSwath Plus Compact bathymetric sonar, the Kongsberg GeoChirp subbottom profiler, magnetometer and side-scan sonar for the shallow water hydrographic and geoarchaeological investigation. Methoni's ancient submerged pier and harbor, a number of historical shipwrecks and artefacts, and ruins of the submerged prehistoric town were recorded in 2D and 3D.

The project is carried out with the support of CARIS, and in the next phase CARIS HIPS and SIPS will be used for bathymetric and side-scan data post-processing, analy-

MTS free student memberships sponsored by Teledyne RD Instruments

Thanks to the Teledyne RD Instruments–sponsored Student Membership program, there are a limited number of free new 1 year memberships available to full-time students. Each MTS member receives access to industry information, news, networking and professional development opportunities, and much more. Graduate and undergraduate students interested in a career in a Marine Technology field should sign up immediately to begin receiving all of the member benefits MTS has to offer aspiring young professionals.

For more information and to download the application form, please visit www.mtsociety.org.

The Underwater Centre provides MSc students with deeper understanding of working subsea

The Underwater Centre is working with the Robert Gordon University (RGU) School of Engineering to incorporate a commercial diving familiarization course as part of the recently introduced MSc in Subsea Engineering 1 year full time course.

The Centre will deliver theoretical sessions covering diving physics, diving physiology, gases and diving systems, and diving regulations, using the extensive facilities and subsea equipment available in Fort William.

The first intake of students visited the Centre in Fort William recently to complete the week-long course, 'Humans in the Ocean'.

Each day began with classroom-based theoretical training sessions before visiting the Centre's various dive sites including the surface-supplied Nitrox and surface-supplied diving sites, and finally the saturation diver training barge.

The students also toured the Centre's recompression chamber facility and ROV training spread. This practical exposure reinforced the theoretical training making it a unique learning experience for RGU's students.

The Masters in Subsea Engineering is aimed at engineers who already have some relevant offshore oil and gas experience and high calibre graduates who wish to enhance their employability in the subsea industry.

A broad range of topics are covered, including well engineering and topside processing facilities, as well as the core areas of subsea engineering including subsea systems, subsea control, pipelines and risers, corrosion and subsea reliability.

For more information, visit www.theunderwatercentre.com.

sis and 3D visualization of the recorded underwater antiquities and of features of potential archaeological interest.

The project objectives also include assessment of the extent of the submerged and semi-buried prehistoric settlement off Methoni, the investigation of evidence for its submersion, the description of physiography and geology of the Methoni bay, the contribution to the monitoring of the erosion pattern along the Methoni coast and the assessment of its impact on the underwater archaeological site evolution.

The project in its final phase will provide consultancy and demonstrate to stakeholders an advanced maritime spatial planning and sea use management platform.

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

Oceans '15 MTS/IEEE conference

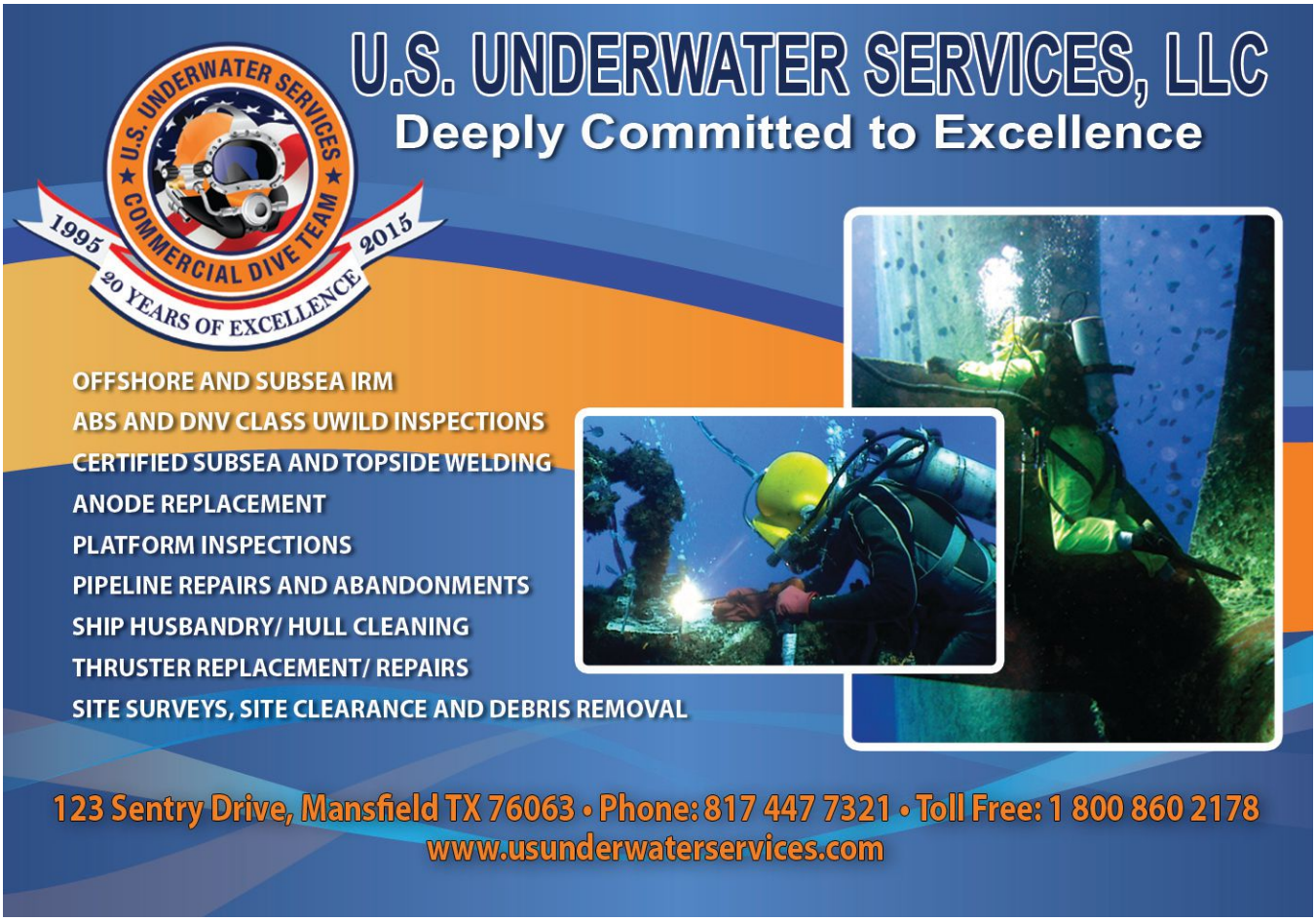
A little over 2,000 people converged on the Gaylord National Resort and Convention Center 19-22 October for OCEANS '15 MTS/IEEE Washington, DC. They comprised a wide variety of technical professionals, researchers, industry leaders, educators, policy makers and students–all interested in sharing the latest information on how marine technology and ocean engineering can support exploring, monitoring, protecting, and wisely using the world's ocean resources.

The conference was honored to have Congressman Sam Farr, co-chair of the House Oceans Conference, and Dr. Rick Spinrad, Chief Scientist of the National Oceanic and Atmospheric Administration (NOAA), as the Honorary Co-chairs. We were very fortunate to have Rear Admiral Tim Gallaudet, Oceanographer of the Navy, join Dr. Spinrad as the featured speakers for the Plenary Session. Their outstanding presentations, on the role of oceanography and its underlying technology in supporting Naval operations and the potential market for tailored information products to support the Blue Economy and mitigate coastal threats, are available on the conference website at www.oceans15mtsieeewashington.org, along with comments by IEEE/OES President René Garello and MTS President Ray Toll.

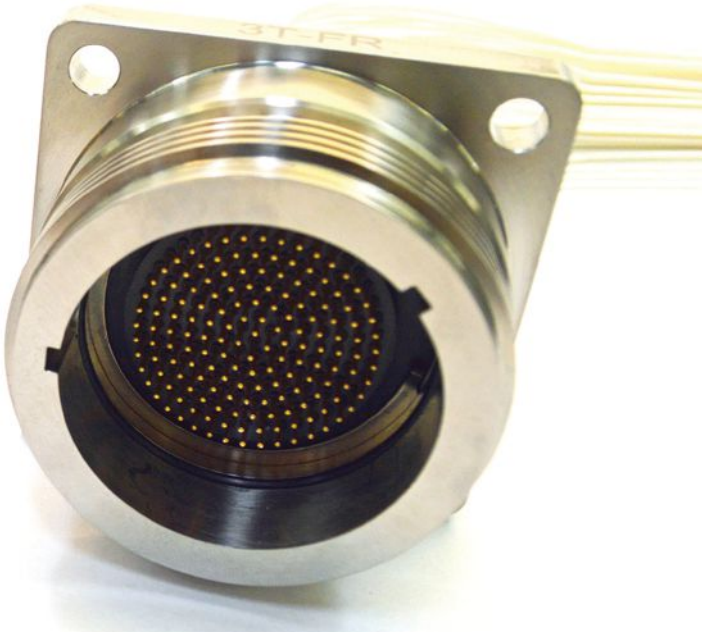
OCEANS '15 Washington, DC upheld the tradition of providing a valuable opportunity for exchanging high quality technical information. Of the 644 abstracts submitted, 488 were accepted into the final program. They were organized into 106 sessions in 11 parallel tracks on Tuesday afternoon through Thursday.

Integrated into the Technical Program were a number of Special Sessions, Town Halls and Panels. These group and interactive sessions have grown in popularity and several were standing room only. NOAA's IOOS program was especially active, partnering with The Maritime Alliance to organize "Ignite! A Lightning Round of Innovations, Discoveries, and Applications in Blue Tech!" and a "Town Hall Session on Marine Technology and Services in the Blue Economy." The Blue Economy theme was continued in the "Town Hall on Promoting OceanSTEM and Blue Economy Work Force Development," which was kicked off by opening remarks from Congressman Farr.

For more information, visit www.oceans15mtsieeewashington.org.



High Density Meets High Performance



When a subsea system requires a two inch diameter connector with 161 electrical conductors and an open faced pressure rating of 6km, it might seem like a lot to ask. Not so of the BIRNS Millennium™ series.

Precisely engineered and meticulously tested, this high performance, high density connector line is trusted worldwide for demanding marine applications in some of the harshest environments on the planet.

BIRNS®

High Performance . . .
Under Pressure®

www.birns.com

BIRNS is NAVSEA PRO-020 Certified;
Our Quality Management System is
ISO 9001:2008 Certified by DNV

See us at booth 809 at
Underwater Intervention 2016

World-first, dual-fuel container ship conversion announced

Wessels Reederei, the German shipping company, has signed a contract with MAN Diesel & Turbo at the Europort exhibition for maritime technology to retrofit the 8L48/60B main engine of its 1,000-teu container ship 'Wes Amelie' to dual-fuel operation. The vessel will be the first of its kind worldwide to be converted to an LNG-capable propulsion system.

Through running on LNG, the Wes Amelie will drastically reduce emissions of sulphur oxide by over 99%, nitrogen oxide by approximately 90%, and carbon dioxide by up to 20%.

Dr. Thomas Spindler, Head of Upgrades & Retrofits – MAN PrimeServ Four-Stroke – MAN Diesel & Turbo, said: "We are very excited about the signing of this contract and view its potential for broader adoption within the maritime sector as significant. We enjoy an excellent cooperation with Wessels and commend their willingness to adopt our dual-fuel technology."

Wessels has earlier stated that the project will promote the demand for LNG as a fuel within the maritime industry where Wessels Reederei GM, Christian Hoepfner, said: "With each rebuild, we are creating an increasing demand for LNG as a clean fuel. Only in this way–and not only through appeals–can the development of an LNG infrastructure continue to gain momentum."

Due to the long delivery time of LNG tanks, the engine retrofit will commence in Q4 2016. Full operational usage of LNG as fuel is planned for early December 2016.

For more information, visit www.mandieselturbo.com.

PortVision® improves vessel-tracking intelligence for better visibility, transparency and market insights

The U.S. Coast Guard added five new data fields in 2015 to expand information about vessel size and voyage details. However, information provided by AIS data alone is limited to a set of unique vessel identifiers with minimal, and usually inaccurate, vessel dimensions. With PortVision's new Vessel Intelligence module, users now have access to information about 50 additional vessel attributes across 10,000 workboats and OSVs, making it significantly easier to identify vessels with specific features or locate nearby vessels for operational or incident-response purposes. PortVision users now have the ability to build custom fleets based on these unique attributes so they can quickly identify not only the best vessel for the job, but what vessel can be there first.

Feature highlights include those listed below.

Enhanced search and analytics capabilities

• Search regionally or globally for vessels with specific attributes, such as all OSVs in the Gulf of Mexico that have a 400-ton or larger crane.

• Determine whether a vessel meets specific requirements by analyzing attributes ranging from moon-pool and total personnel capacity to main engine horsepower and on-board equipment.

• Schedule email alerts when a vessel of interest stops, starts, departs, arrives, slows, heads in a new direction or otherwise changes its behavior.

• Receive customized reports on current position and other attributes for one or more vessels.

Improved historical view

• Display full vessel movement history for any specific vessel of interest.

• Identity all vessels that have been working in a specific lease block.

• See what vessels are doing now and how long they've been doing it.

Better incident response

• Identify available vessels in close proximity to the incident.

• Incorporate available port calls for re-supply planning.

For more information, visit www.portvision.com.

Halul Offshore Services brings offshore support vessel simulator to Qatar

Halul Offshore Services Company, a wholly owned subsidiary of Milaha, has recently procured a state-of-the-art Offshore Support Vessel (OSV) Ship Handling Simulator from VSTEP, which is the first of its kind in Qatar. Halul is now one of the few companies in the Gulf region to own the Netherlands-built simulator, which is normally used in training schools. Chairman of Milaha, HE Sheikh Ali bin Jassim Al Thani; Milaha's president and CEO, Mr. Abdulrahman Essa Al-Mannai; and Halul's CEO, Mr. Vivek Seth, accompanied by the management teams, attended the inauguration of the simulator which was followed by a presentation of its capabilities.

Halul's CEO, Mr. Vivek Seth said: "This simulator will significantly add to our crew's ship handling skills, and help them become better prepared for their next assignment on board our fleet of over 40 vessels. We continue to show our commitment to develop our team and provide a safe and reliable operation for our clients. Technically speaking, with this simulator we can create scenarios for towing operations like rig moves, berthing, unberthing, and tanker assist operations offshore. The simulator has an option to program for both azimuth and conventional driven vessels. We also have a dynamic positioning system integrated with the simulator."

In addition to the simulator training, Halul continues to provide other forms of practical on-board training to its crew. This covers safety drills, mooring, unmooring, and dynamic positioning system familiarization, among other operations.

For more information, visit www.haluloffshore.com.

Bordelon Marine takes delivery of the M/V Brandon Bordelon, a DP2 ultra-light intervention vessel

In November, 2015 Bordelon Marine took delivery of the MV Brandon Bordelon. This highly specialized vessel features a helideck, a 60-ton AHC crane with 3,000 m of wire, POB (60), a mezzanine deck with internal office, and control rooms capable of supporting two full work class ROV systems.

The vessel also offers 6,200 sq. ft of clear useable deck space. The Brandon comes equipped with two Ranger2 Pro thru-hull USBL full systems. The vessel delivers a fully integrated ROV control room, ROV support offices, below deck work and storage spaces, extensive communications and ROV data network, plug and play, with patch panel racks installed–all tied into the vessel systems, bridge, office, and accommodation spaces.

The vessel is designed with removable bulwarks around the entire aft of vessel along with power, water, air, and hydraulic oil connections on the deck. The vessel is also equipped with four additional below-deck Tier 3 generators, providing fully redundant power to the crane and ROV systems.

President and CEO Wes Bordelon said, "This vessel is the next generation design of the Stingray series and continues our commitment of the ULIV concept to the subsea market. With the addition of a helideck and other integrated systems, the Brandon provides an additional highly capable and low cost vessel option to our clients."

For more information, visit www.bordelonmarine.com.

GE Marine supports China's high-tech shipbuilding with innovative technologies

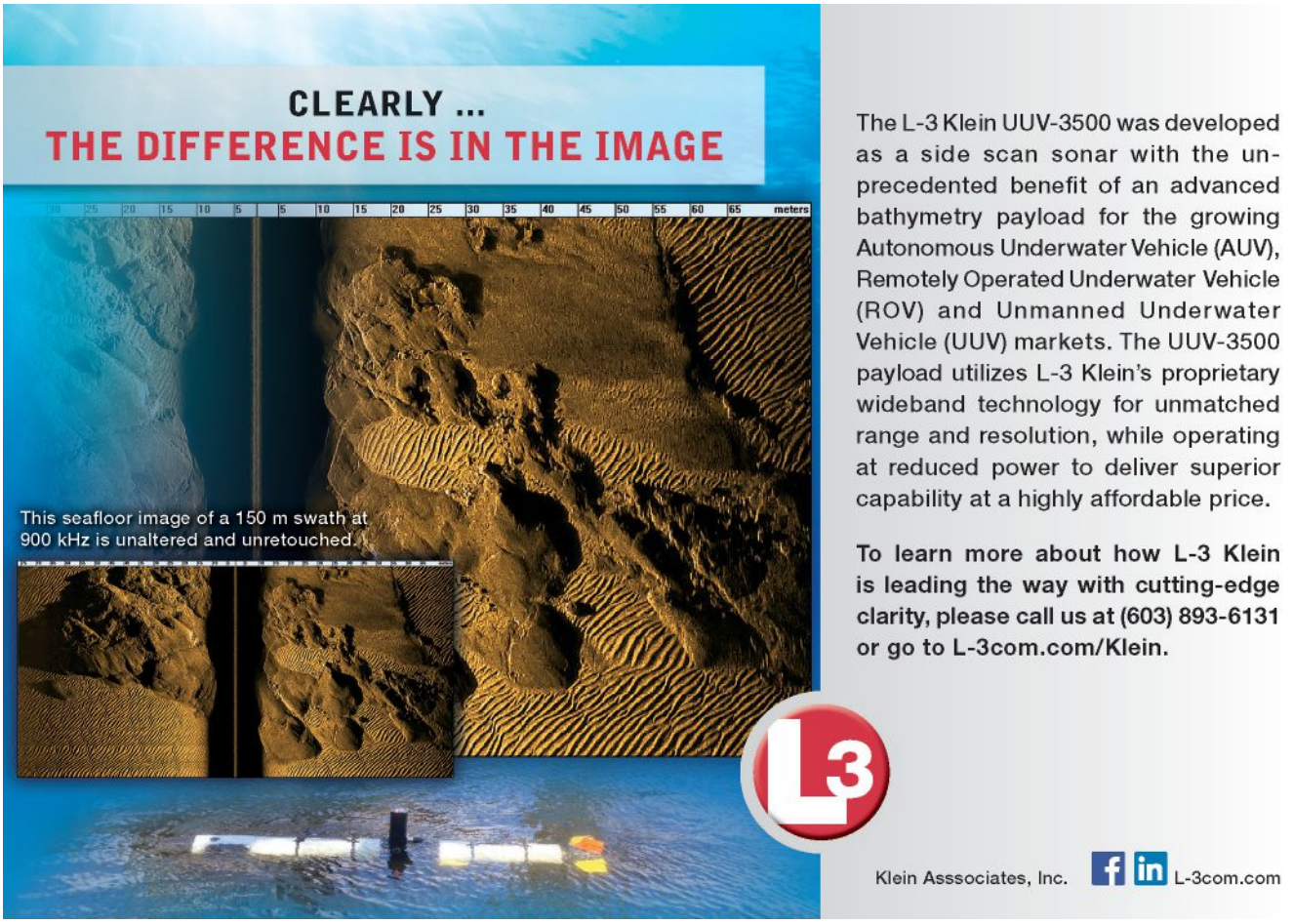
GE Marine showcased a series of advanced marine technologies that will continue to support China's high-tech shipbuilding at the recent Marinetec 2015 conference. The current low oil price and marine industry down cycle have posed many challenges to China's shipbuilders. With investment restraint and increasing cost pressure, ship operators and owners are looking for solutions that will require lower CAPEX while delivering both efficiency and cost savings.

GE Marine and Dalian Shipbuilding Industry Company, Ltd. (DSIC) have received Approval in Principle (AiP) from Lloyd's Register for their gas turbine-powered Liquefied Natural Gas (LNG) carrier design. The innovative 179,400-cbm LNG carrier will be powered by GE's COmbined Gas turbine Electric and Steam (COGES) system using GE's popular 25-MW aero derivative marine gas turbine. The 25-MW gas turbine is essentially a modified jet engine, that has high reliability (>99.9%) and outstanding availability.

With the AiP in hand, customers can feel confident in procuring a COGES-powered LNG carrier. Operational benefits of gas turbines to naval architects, owners and operators include high power in a compact package and design flexibility. The gas turbine is so lightweight–80% lighter and 30% smaller than comparable slow-speed diesel applications–that it can be located anywhere in the ship. This compact, lightweight LNG carrier design also allows room for more cargo–some 4,000 cu. m of additional space in the same size hull –along with low emissions and the flexibility to operate on LNG or liquid fuel.

GE is also transforming into a premier digital industrial company, leveraging the power of the Industrial Internet to drive industrial efficiencies to new heights. Powered by Predix*, the cloud-based platform designed for industrial applications, GE Marine's software analytics will enable data-driven decision-making in fleet and operational planning, improving operational efficiency, increasing uptime and helping to maximize revenue.

For more information, visit www.gepowerconversion.com.



Research shows reality of runaway ice loss in Antarctica

A new study led by Victoria University of Wellington researchers reveals the potential for runaway ice loss in Antarctica. By studying rocks at different elevations beside the East Antarctic Ice Sheet (EAIS), the team concluded that a period of rapid glacier thinning occurred in the recent geological past and persisted for several centuries.

Satellite observations show that parts of the Antarctic ice sheet are currently thinning in response to a warming ocean. Of particular concern is the potential for "marine ice sheet instability," where an initial retreat of ice margins into deepening valleys could lead to continued, unstable ice loss.

The new research, led by Victoria Postdoctoral Research Fellow Dr. Richard Jones, indicates that the processes leading to instability can be initiated by just minor climate warming.

"The finding is very important for predicting Antarctica's future contribution to sea level change," says Dr. Jones. "Particularly when considering that the EAIS contains enough vulnerable ice to raise sea level by tens of meters.

"It might only require a small amount of climate variation to initiate runaway ice loss, and it could continue for centuries to millennia," says Dr Jones.

While this process has been posited for many years, the study presents the first directly recorded evidence that it has taken place in the past, providing new insight into the future behaviour of rapidly changing parts of Antarctica today.

A major strength of the study was combining numerical modeling experiments that simulate glacier retreat with geological data processed in Victoria University's world-class cosmogenic nuclide laboratory.

The laboratory studies rare isotopes produced through the interaction of cosmic radiation with minerals on the Earth's surface, which allows for the calculation of the age of a rock surface.

"Most research has previously focused on the West Antarctic Ice Sheet, which makes these observations from East Antarctica all the more significant," says Dr. Jones.

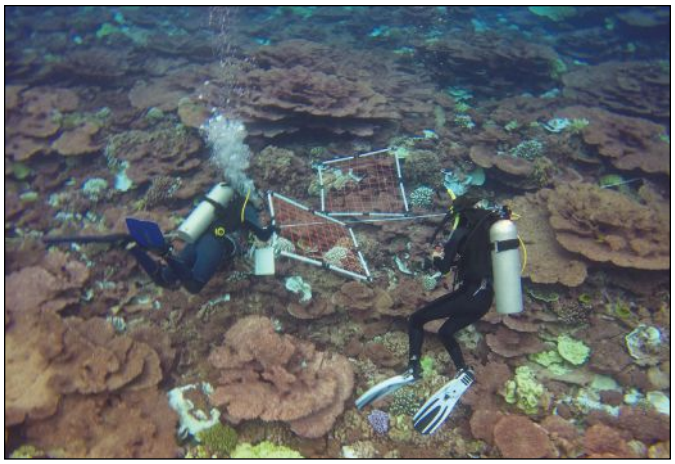
Dr. Jones' research has been published in the journal Nature Communications.

The field work and data collection conducted as part of this study were captured in a video and can be viewed online at https://vimeo.com/80447422.

Working with Dr. Jones were colleagues Associate Professor Andrew Mackintosh and Dr. Nick Golledge from Victoria University's Antarctic Research Centre; Dr. Kevin Norton from Victoria's School of Geography, Environment and Earth Sciences; Dr. Chris Fogwill from the University of New South Wales Climate Change Research Centre; Dr. Peter Kubik and Dr. Marcus Christl from the Laboratory of Ion Beam Physics in Switzerland; and Sarah Greenwood at the Department of Geological Sciences at Stockholm University.

For more information, visit www.victoria.ac.nz.

El Niño warming causes significant coral damage in central Pacific



Georgia Tech graduate student Pamela Grothe performs benthic surveys in a field of dead Acropora coral colonies on a Christmas Island reef. Photo credit: Kim Cobb, Georgia Tech.

Current El Niño conditions in the Pacific Ocean have created high water temperatures that are seriously damaging coral reefs, including those on Christmas Island, which may be the epicenter for what could become a global coral bleaching event.

Researchers from the Georgia Institute of Technology recently returned from the island and are reporting that 50% to 90% of corals they saw were bleached and as many as 30% were already dead at some sites. The situation could worsen as water temperatures remain well above normal into the early months of 2016.

"This El Niño event is driving one of the three largest global scale bleaching events on record," said Kim Cobb, a professor in Georgia Tech's School of Earth and Atmospheric Sciences who has studied long-term El Niño conditions. "Ocean temperatures exceeded the threshold for healthy corals back in the summer, and are continuing to warm. Bleaching occurs when temperatures exceed a threshold that is function of the amount of warming, as well as the length of time at that temperature."

Cobb has studied reef systems on Christmas Island for 18 years, and recently returned from a 2-week visit to the area. She and other researchers measured water temperatures of 31°C, well above normal water temperatures of 27°C.

The last time water temperatures reached such levels was during the 1997-98 El Niño event, which was the largest ever recorded–until now. Until the current record-breaking El Niño event, the Christmas Island reefs had been thriving and healthy.

Georgia Tech researchers are planning to return to Christmas Island in March to assess the full impact of the damage.

For more information, visit www.rh.gatech.edu.

Charting the Gulf: Analyzing the Gaps in Long-term Monitoring of the Gulf of Mexico

More than 5 years since the BP Deepwater Horizon oil disaster tragically claimed 11 lives in the Gulf of Mexico, the impact of millions of barrels of oil that spewed into the waters still exists. In the aftermath of the oil disaster, Ocean Conservancy created Charting the Gulf: Analyzing the Gaps

in Long-term Monitoring of the Gulf of Mexico to better enable scientists and decision-makers to track the health of the Gulf of Mexico. This analysis is a comprehensive review of which priorities are being monitored in the Gulf.

According to Alexis Baldera, conservation biologist at Ocean Conservancy and co-author of Charting the Gulf, "One of the most surprising lessons I learned from the BP Deepwater Horizon oil disaster was how many major gaps exist in our understanding of the Gulf. These must be addressed in order to understand if restoration is successful. Just like a doctor needs a patient's history to effectively track treatment of an injury, we need a complete picture of the health of the Gulf of Mexico in order to restore this special place."

Findings from Charting the Gulf reveal that that Gulf's wildlife and habitats in the offshore environment are not monitored to the same degree as those in the coastal areas. This monitoring is vital for species like bottlenose dolphins, which will likely need 40 to 50 years to fully recover, along with deep-water corals, which could need as much as hundreds of years to improve.

For more information, visit www.oceanconservancy.org.

Rapid plankton growth in ocean seen as sign of carbon dioxide loading

A microscopic marine alga is thriving in the North Atlantic to an extent that defies scientific predictions, suggesting swift environmental change as a result of increased carbon dioxide in the ocean, a study led by a Johns Hopkins University scientist has found.

What these findings mean remains to be seen, as does whether the rapid growth in the tiny plankton's population is good or bad news for the planet.

Published in the journal Science, the study details a ten-fold increase in the abundance of single-cell coccolithophores between 1965 and 2010 and a particularly sharp spike since the late 1990s in the population of these pale-shelled floating phytoplankton.

"Something strange is happening here, and it's happening much more quickly than we thought it should," said Anand Gnanadesikan, associate professor in the Morton K. Blaustein Department of Earth and Planetary Sciences at Johns Hopkins and one of the study's five authors.

Gnanadesikan said the Science report certainly is good news for creatures that eat coccolithophores, but it's not clear what those are. "What is worrisome," he said, "is that our result points out how little we know about how complex ecosystems function." The result highlights the possibility of rapid ecosystem change, suggesting that prevalent models of how these systems respond to climate change may be too conservative, he said.

The team's analysis of continuous plankton recorder survey data from the North Atlantic Ocean and North Sea since the mid-1960s suggests rising carbon dioxide in the ocean is causing the coccolithophore population spike, said Sara Rivero-Calle, a Johns Hopkins doctoral student and lead author of the study. A stack of laboratory studies supports the hypothesis, she said. Carbon dioxide is a greenhouse gas already fingered by scientific consensus as one of the triggers of global warming.

For more information, visit www.jhu.edu.

Ireland welcomes Apple's commitment to ocean energy

The Sustainable Energy Authority of Ireland (SEAI) announced a Memorandum of Understanding with Apple to promote the development of ocean energy in Ireland. Apple has committed a €1 million fund that will help developers who receive an SEAI grant to test their ocean energy prototypes in the Galway Bay Ocean Energy Test Site.

Welcoming the announcement Minister for Communication, Energy and Natural Resources Alex White T.D., said, "The west coast of Ireland is recognized as having some of the best wave resources in the world and I warmly welcome this agreement between Apple and SEAI to help harness this renewable source of energy. "This is an excellent achievement for Ireland and shows that when it comes to ocean energy development, Ireland is definitely open for business."

"We are delighted to have the opportunity to collaborate with Apple. Its track record in development and innovation is second to none and its support to the emerging wave energy industry will be a major boost nationally," said Dr. Brian Motherway, SEAI's CEO.

The Galway Bay test site, in operation since 2006, is a state-of-the-art facility that enables the testing of wave energy technologies at quarter scale.

"We're excited by the potential of ocean energy to someday serve as a source of clean power for the data center we are building in Athenry, County Galway," said Lisa Jackson, Apple's vice president of environment, policy and social initiatives. "We are deeply committed to powering all our facilities with 100% renewable energy and believe investing in innovative projects will make reaching our goal easier."

For more information, visit www.seai.ie.

GE expands wind portfolio

GE introduced its new Renewable Energy business at the European Wind Energy Association's 2015 Annual Event in November. The new unit significantly expands GE's wind portfolio in the wake of its recent acquisition of Alstom's power and grid businesses.

In addition, GE Renewable Energy welcomed a new offshore wind unit into the portfolio. Featuring new Haliade turbine technology, the offshore business has built a significant backlog of orders with EDF in France and has been selected for the Merkur offshore project in Germany. The Haliade technology will also be featured in the historic Block Island project, which is set to become the first offshore wind farm in the United States. Construction is underway and the project will begin operation next year.

"Offshore wind is a challenging industry, but we believe the market has real potential," said Anders Soe-Jensen, president & CEO of GE's offshore wind unit. "Our goal is to work closely with customers to continue validating our technology as we begin to scale and grow the business."

Customers can also expect to see service-related benefits resulting from the acquisition. GE Renewable Energy plans to extend its services capabilities across both existing fleets, with an emphasis on using cutting-edge digital and analytics capabilities to help customers improve productivity and increase power output. Earlier this year, GE launched its Digital Wind Farm, which aims to create a digital infrastructure for the wind industry. The Digital Wind Farm harnesses the analytics power of the GE Store and is powered by Predix, the secure software platform for the industrial Internet.

For more information, visit www.ge-alstom.com.

Interior takes first step to develop wind energy offshore South Carolina

The Bureau of Ocean Energy Management (BOEM) has issued a call for information and nominations (Call) to gauge the offshore wind industry's interest in acquiring commercial wind leases in four areas offshore South Carolina, totaling more than 1,100 sq. mi on the Outer Continental Shelf, and to request comments regarding site conditions, resources and other uses in and near those areas.

The Call and the NOI were published in the Federal Register on 25 November 2015, and BOEM will accept public comments for 60 days. In addition, BOEM will hold public information meetings to provide additional opportunities for the public to comment on the Call and the NOI.

For more information, visit www.boem.gov.

Tocardo, Huisman install tidal power plant in Dutch Eastern Scheldt

A wave energy project in The Netherlands has begun producing power. Tocardo Tidal Turbines, designer and producer of tidal and free-flow water turbines, and Huisman, designer, builder and financial sponsor of the turbine's suspension structure, have installed five tidal turbines in the Eastern Scheldt storm surge barrier (Oosterschelde barrier) to generate clean energy. This installation is the largest tidal energy project in the Netherlands as well as the world's largest commercial tidal installation of five turbines in an array.

The project was officially opened on 25 November by Dutch Labor Party leader Diederik Samsom. It marks a milestone for Tocardo and for the tidal energy industry.

The 50-m long and 20-m wide structure was transported over water to the work island Neeltje Jans. Taking into account the water levels, the tides and the weather and using the slides of the storm surge barrier, the tidal power plant was placed on a floating pontoon combined with lifters and installed between the pillars under the Oosterschelde barrier.

The Eastern Scheldt storm surge barrier is the largest of the world-renowned Delta Works series of dams and storm surge barriers, designed to protect the Netherlands from flooding from the North Sea. The location will now be a combination of water defenses and hydroelectric power.

Besides Tocardo and Huisman, many other Dutch companies are involved in this project. Strukton has been actively involved in the project planning and is fully responsible for project management during installation. Mammoet's involvement in the project comprises the transportation and installation of the Tidal Power Plant at the Easter Scheldt storm surge barrier. Istimewa Elektrotechniek, Van der Straaten and Hillebrand also play an important role in terms of the electro-technical installation and steel structures.

For more information, visit www.tocardo.com.

Symposium looks at the value of marine spatial planning for offshore wind

In a system that increasingly judges the importance of a project by its financial return, how can scientists place a value on Marine Spatial Planning (MSP), particularly when it comes to the placing of offshore wind farms? That was a recurring theme at the 2015 International Marine Spatial Planning Symposium, held in October at the Coastal Resources Center (CRC) and the Rhode Island Sea Grant at the University of Rhode Island's Graduate School of Oceanography.

The symposium brought together more than 150 participants (in person and online) working in the field of marine spatial planning to share their opinions and experiences. The

nearly two dozen presenters brought a broad range of expertise from their work in the U.S., Canada and Europe.

"In 2010, after 2 years of research and stakeholder participation, Rhode Island became the first state in the United States to formally adopt a federally approved Marine Spatial Plan," said Jennifer McCann, director of U.S. Coastal Programs at the CRC and director of Extension Programs for Rhode Island Sea Grant. "We soon found that many people working in this field were interested in what we did and how we did it, so in 2012, we organized the first MSP symposium. This was a gathering where people could talk about their problems and how the Rhode Island MSP was improving the regulatory process, as well as protecting the environment and the economy. "

"These strategies were successful and had a big impact on people. Soon they were asking when the next symposium would take place," McCann continued. "We felt that we had to put that together and thank the Moore Foundation and the Rhode Island Sea Grant College Program for being great supporters for this symposium."

Many of the presenters attempted to take on the issue of valuating marine spatial planning–putting it in terms that value-driven societies often have difficulty grasping.

Keynote speaker Jeffrey Grybowski, CEO of Deepwater Wind, had no doubts that MSP is valuable. Deepwater Wind is building the first offshore wind farm in the United States, off the Rhode Island coast near Block Island. With a barge carrying pieces of the foundations for the first turbines to go into U.S. waters passing the URI campus in the background, Mr. Grybowski praised the work of the CRC. He said that the Rhode Island MSP project, known as the Ocean Special Area Management Plan (Ocean SAMP), had saved Deepwater Wind at least 2 years' worth of work to obtain its permitting for the wind farm.

In fact, Mr. Grybowski went much further, "Many offshore wind projects have been proposed," he said. "None have been built. What separates the Block Island project from the others is that the Ocean SAMP process identified the location. The state of Rhode Island said that off the southeast coast of the island was the best place to put a wind farm. Then the developer came along and said 'I'll build it there. Thank you for identifying the spot.' In every other case that I know of in the United States, the reverse happened. The developer came along and said 'I'd love to build a wind farm here for you. This is why you should agree with me.' Those projects didn't get built. There's a really powerful lesson there that is lost on no one in my business, for sure, and I think it's a great case study."

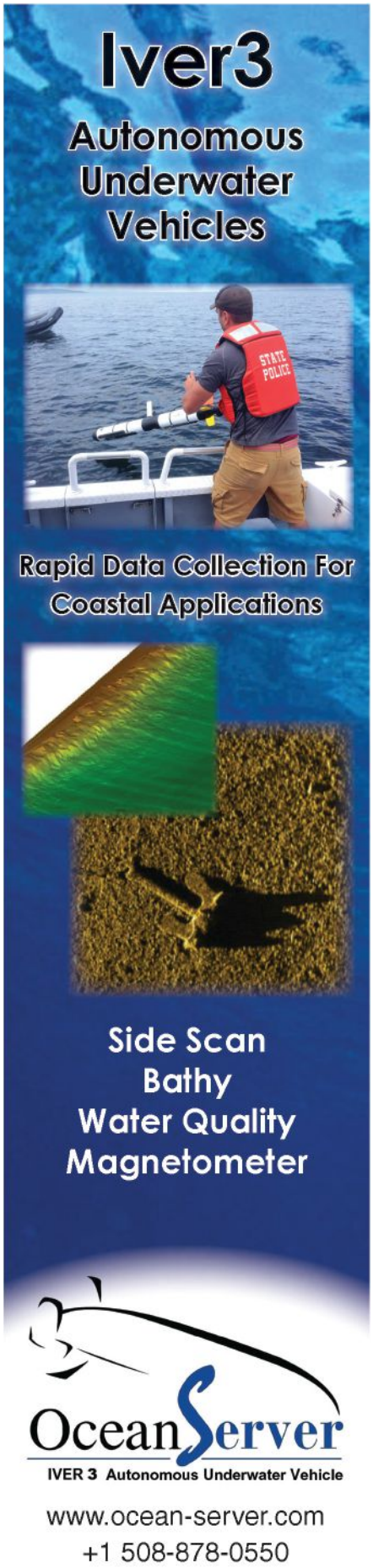
Another speaker, Dallas W. Smith, approached the question from a unique perspective. Smith, the founder, president and CEO of Nanwakolas Council, a cutting edge First Nations organization that protects and manages First Nation cultural values, noted the cultural differences between a society that continuously places a monetary value on activities, versus one that places a higher value on the social and cultural benefit that the activity brings.

"We are a holistic people," Smith said. "The marine and terrestrial environments have to integrate. Building relationships [while working on terrestrial land-use planning] gave us a smoother transition into the marine planning world. Our long-term goal is to assert our sovereignty. We have tremendous relationships that gives us the ability to unearth the scientific data we need to help our positions, to declare our sovereignty and build our capacity that is necessary to allow us to be part of the decision making process."

"The coast of British Columbia was able to sustain hundreds of thousands of people for 10,000 years and in the 180 short years of contact we've devastated the fishing industry, we've devastated the forestry industry. And we've had to find a way to re-kindle that balance so we can still sustain our people going on into the future. It's only through relationship building and planning process that you're able to do that. It has opened opportunities that allow us to have that capacity on the ground to introduce our cultural values into the decision making process but also find that economic balance that needs to be there," he continued.

"These aren't First Nations issues. These are human nature issues. There's always the fear of the unknown. There's always fear of putting your thoughts and dreams down on paper and having someone contradict that and say, 'No, that doesn't mean anything at the end of the day.' The key is relationship building. You have to be able to look each other in the eye at the end of the day and be comfortable that you're hearing each other. Not listening but actually hearing–there's a difference. It's only through efforts like this where you bring multi-cooperative stakeholder efforts together where people understand that it's all about human nature," Smith said.

For more information, visit www.crc.uri.edu.



Companies agree to participate in Portugal floating wind project

Mitsubishi Corporation (MC) and Chiyoda Corporation (Chiyoda) are pleased to announce that MC (through its subsidiary Diamond Generating Europe), Chiyoda (through its subsidiary Chiyoda Generating Europe), EDP Renewables, Repsol, and Engie have agreed to participate in floating offshore wind farm project in Portugal–WindFloat Atlantic Project (WFA), by acquiring a stake in Windplus, S.A., the project owner. MC and Chiyoda will hold a 20% share respectively in the project.

The project, located 20 km off the Portuguese coast at Viana do Castelo, is planned to be operational in 2018 and will consist of 3 or 4 wind turbines on floating foundations, accounting for a total capacity of 25 MW. WFA will benefit from the support of the European Commission, through the NER 300 Program, and of the Portuguese Government through the Portuguese Carbon Fund. It was also selected for the InnovFin program by the European Investment Bank.

The consortium will use the WindFloat technology, an innovative semi-submersible foundation developed by Principle Power, Inc. This technology was already implemented in a first of its kind prototype called WindFloat 1 near Póvoa do Varzim. It comprises 2 MW Vestas V80 commercial wind turbine mounted on a WindFloat floating offshore wind turbine foundation.

The prototype has already produced more than 16 GWh over almost 4 years of operation–performing excellently through extreme weather conditions. Its successful results have been key for the creation of this consortium and the launch of the WindFloat Atlantic project, the aim of which is to demonstrate the economic potential and reliability of this technology, advancing it further in the path towards commercialization.

For more information, visit www.mitsubishi.com.

Isle of Man signs agreement to explore potential for offshore wind farm development

The Department of Infrastructure has signed a contract aimed at further unlocking the Isle of Man's potential to become a leader in offshore energy production. The Agreement for Lease will allow DONG Energy to explore the possibility of developing a wind farm in Manx waters off the northeast coast of the island.

The creation of an offshore energy hub is one of the core strategies of the Government's long-term plans for economic growth. Leasing parts of the Isle of Man's seabed for renewable energy generation is expected to make a significant contribution to public funds and local job creation as well as lowering carbon emissions.

DONG Energy is one of the leading energy groups in Northern Europe and recently announced plans to build the world's biggest offshore wind farm in the Irish Sea off the coast of Cumbria. Walney Extension is expected to be fully commissioned in 2018, surpassing the scale of the London Array Offshore Wind Farm.

The agreement with the Department of Infrastructure will enable the company to carry out preliminary surveys to determine the practicality and commercial viability of siting wind turbines within the 12-mi limit of the Island's territorial sea.

Any wind farm development would be subject to approval under the relevant consenting regime and would also require the submission of a full environmental impact assessment, taking into account the need to protect transport links and fisheries.

For more information, visit www.gov.im.

GIBFS raises renewables fund at second close

UK Green Investment Bank Financial Services Limited (GIBFS) has announced that it has executed a Second Close on new commitments of £355 million for the Offshore Wind Fund (the Fund), bringing total committed capital to £818 million and nearing its £1 billion target. This makes the GIBFS-managed fund the largest renewable energy fund in the UK.

Second close investors include Swedish life insurance and pension company AMF Pensionsförsäkring AB (AMF) and Strathclyde Pension Fund. The Fund represents their first investments in the UK offshore wind sector. Second close investors join UK-based pension funds, a major sovereign wealth fund and UK Green Investment Bank plc (GIB) in the partnership, which held an initial close on £463 million earlier this year.

The Fund is the first in the world to be dedicated solely to investments in offshore wind power generation and provide long-term institutional investors with the opportunity to access the UK's green infrastructure sector.

The second close has been marked with the acquisition by the fund of GIB's option on a 10% stake in Gwynt y Môr offshore wind farm. The 576 MW wind farm–located in Liverpool Bay–was officially inaugurated in June of this year.

The Fund now has three assets. These three offshore wind farms are able to produce 2,980 GWh of renewable energy annually, enough to power more than 700,000 homes or all the homes in Northern Ireland.

On completion of the Gwynt y Môr acquisition, more than half of the Fund's capital will be invested in income-generating assets.

For more information, visit www.greeninvestmentbank.com.

Mauritius and Australia agree to cooperate in marine renewable energy

Mauritius and Australia signed in Port Louis an agreement on Assessing Wave Energy and Micro Grid in Mauritius. A study will be conducted by the Australian firm Carnegie Wave Energy Limited. To this effect, a funding proposal of about AU$990,000 was endorsed for the project.

The agreement reiterates the emerging cooperation between Australia and Mauritius in developing the Blue economy, one of the three key pillars of the New Economic Strategy; the other two pillars being the Maritime hub and the economic integration within the region and Africa.

The agreement is a follow up to a Memorandum of Understanding signed with the Mauritius Research Council in June this year with focus on three key areas: the delivery of a renewable energy roadmap for Mauritius, including technical, commercial and financial feasibility of high penetration renewable energy; the assessment of the Mauritian wave energy project; and the design of a microgrid powered desalination plant in Mauritius and Rodrigues.

For more information, visit www.govmu.org.

Extraordinary Quality
High Affordability

- High Resolution
- Highly Robust and User Friendly
- Highly Cost-Effective Swath Bathymetry System

EchoSweep Multibeam Echosounder

- Number of Beams: 140
- Range: up to 280 m
- 140° Swath Coverage
- Free Software for Real-time Operation and Post-processing

- Highly Robust and Accurate Acoustic Doppler Technology
- Significantly Longer Range
- Highly User Friendly And Cost Competitive

FlowQuest Acoustic Current Profilers

- Range: up to **900 m**
- Depth: up to 6,000 m
- Accuracy: up to 0.25% ± 2.5 mm/s
- Data Fusion and Acoustic Modem Options

- The World's Smallest DVL
- Ideal For Underwater Precision Navigation
- Significantly Longer Range
- Smallest Minimum Altitude

NavQuest Doppler Velocity Logs (DVL)

- Range: up to **300 m**
- Minimum Altitude: 0.3 m
- Depth: up to 6,000 m
- Accuracy: up to 0.2% ± 1 mm/s

- The Best Selling USBL Systems In The World
- Broadband Acoustic Spread Spectrum Technology
- Highly Accurate, Robust and Cost Effective

TrackLink USBL Tracking Systems

- Range: up to 11,000 m
- Depth: up to 7,000 m
- Targets: up to 16
- Accuracy: up to 0.15 degree
- Price: from $15,000

- The Best Selling Acoustic Modems In The World
- Broadband Acoustic Spread Spectrum Technology
- Transport 95% of The World's Acoustic Communication Data

High Speed Underwater Acoustic Modems

- Data Rate: up to 38,400 baud
- Bit Error Rate: $< 10^{-9}$
- Range: up to 10,000 m
- Depth: up to 7,000 m

LinkQuest Inc. www.link-quest.com

Tel: (858) 623-9900, 623-9916 Fax: (858) 623-9918
6749 Top Gun Street, San Diego, CA 92121, USA
Email: sales@link-quest.com

Deputy Assistant Secretary of the Navy for Unmanned Systems named

Navy Secretary Ray Mabus has named retired Brig. Gen. Frank Kelley to be Deputy Assistant Secretary of the Navy (DASN) for Unmanned Systems.

"General Kelley's superb operational experience as a U.S. Marine as well as his professional expertise in the field of electronic warfare and unmanned technology make him perfectly qualified to lead this new enterprise in the Department of the Navy, and I look forward to the great work he and his team will be spearheading," said Mabus.

Kelley is the first DASN for Unmanned Systems and will assist in the planning and prioritization of unmanned systems as well as develop acquisition strategies to obtain these emerging capabilities.

The Department of the Navy officially launched the Unmanned Warfare Systems Division (N99) 15 September as part of the OPNAV staff. Rear Adm. Robert Girrier was named Director, Unmanned Warfare Systems (N99).

"The change to the organization is a reflection of the priority we're placing on this emerging capability and how critical it is that there is centralized leadership for our unmanned programs," Mabus said.

N99 is responsible for developing and accelerating unmanned systems into the Navy's warfighting capabilities as well as assessing integration of unmanned systems within the Navy. Through this new approach, resources are optimized and technical risk is reduced, saving time and money.

Girrier is responsible for the rapid development and integration of unmanned systems across portfolios currently resourced by four warfare divisions–Expeditionary Warfare (N95), Surface Warfare (N96), Undersea Warfare (N97) and Air Warfare (N98)–as well as the Deputy Chief of Naval Operations for Information Dominance and Director of Naval Intelligence (N2/N6).

L-3 awarded $12.5 M for Undersea Range work

L-3 Communications MariPro Inc., Goleta, California, is being awarded a $12,581,094 modification to a previously awarded firm-fixed-price contract (N66604-12-C-2838) to exercise an option for the Ocean Sensor Sub-System (OSS) and the Shore Electronics System (SES) installation in support of the Undersea Warfare Training Range (USWTR), located off the coast of Jacksonville, Florida.

Work will be performed in Goleta, California (85%); Newington, New Hampshire (10%); and Mayport, Florida (5%) and is expected to be completed in May 2019. Fiscal 2016 other procurement (Navy) funds in the amount of $12,581,094 will be obligated at time of award, none of which will expire at the end of the current fiscal year. The Naval Air Warfare Center, Training Systems Division, Orlando, Florida, is the contracting activity.

Hydroid to deliver more MK 18 system assets

Hydroid, Inc., Pocasset, Massachusetts, is being awarded an $8,662,533 modification to previously awarded firm-fixed-price, indefinite-delivery/indefinite-quantity contract (N00174-13-D-0005) to increase quantities for the procurement of additional MK 18 Family of System assets.

The MK 18 program supports unmanned underwater vehicle systems. Work will be performed in Pocasset, Massachusetts and is scheduled to be complete by September 2017.

No additional funds are being obligated at time of award. The contract was awarded on a sole-source basis in September 2013 in accordance with FAR 6.302-1(a)(2)–only one responsible source and no other supplies or services will satisfy agency requirements. The Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, Maryland, is the contracting activity.

Navy commissions newest littoral combat ship

The U.S. Navy commissioned the nation's fifth Littoral Combat Ship (LCS)–USS Milwaukee (LCS 5)–in Milwaukee, officially placing the ship designed and constructed by a Lockheed Martin-led industry team into active service.

Milwaukee, the third Freedom-variant in the LCS class, successfully passed Acceptance Trials in September and was delivered to the U.S. Navy on 16 October.

The fifth U.S. Navy vessel bearing the name, Milwaukee will transit to its homeport in San Diego, California, where it will be integrated into the fleet and the industry-Navy team will conduct additional program testing and crew training.

The Lockheed Martin-led industry team, which includes shipbuilder Fincantieri Marinette Marine and naval architect Gibbs & Cox, has already delivered two Freedom-variant littoral combat ships to the U.S. Navy. USS Freedom conducted a successful deployment to Southeast Asia in 2013 and is currently operating out of her homeport in San Diego. USS Fort Worth is currently deployed in Southeast Asia, serving in the U.S. 7th Fleet.

The commissioning is the final act that marks entrance of a ship into the naval forces of her nation. It is the final of three events that bring a ship to life: keel laying, launching and christening, and commissioning.

For more information, visit www.lockheedmartin.com.

Coast Guard leaders from Arctic nations sign historic joint statement

A joint statement, officially establishing the Arctic Coast Guard Forum (ACGF), was signed on 30 October by leaders representing all eight coast guard agencies of the Arctic nations.

The Arctic Coast Guard Forum (ACGF) is an operationally focused, consensus-based organization with the purpose of leveraging collective resources to foster safe, secure, and environmentally responsible maritime activity in the Arctic. Membership includes Canada, Denmark, Finland, Iceland, Norway, Sweden, the Russian Federation, and the U.S.

The signing ceremony marked the successful conclusion of a summit held at the U.S. Coast Guard Academy on 28-30 October 2015. The ACGF will reconvene for an Experts Meeting in spring 2016.

For more information, visit www.uscg.mil.

Contract awarded for HMS Anson

The UK Ministry of Defence has awarded BAE Systems a contract for the delivery of the fifth Astute Class submarine, taking the total value for work on the vessel to £1.3 billion.

The full contract covers the design and remaining build, test and commissioning activities on Anson, the fifth of seven technologically advanced submarines in the class. Manufacturing commenced in 2010. Anson is now at an advanced stage of construction at our Barrow-in-Furness, Cumbria site and on schedule to leave for sea trials in 2020.

Tony Johns, managing director of BAE Systems Submarines, said, "Signing this contract is an important milestone in the Astute program. This is a hugely complex national endeavor and we are proud of the role we play in helping to protect our nation's interests. HMS Astute and HMS Ambush are already demonstrating their world-class capabilities with the Royal Navy, while the third submarine in the class, Artful, is continuing with her sea trials. The build phase for the fourth, Audacious, is also well advanced, so we continue to make positive progress across the program."

Astute class submarines mark a step change in defense capability. Powered by a nuclear-reactor, each of the submarines will provide land strike, strategic intelligence gathering, anti-submarine and surface ship warfare capabilities.

For more information, visit www.baesystems.com.

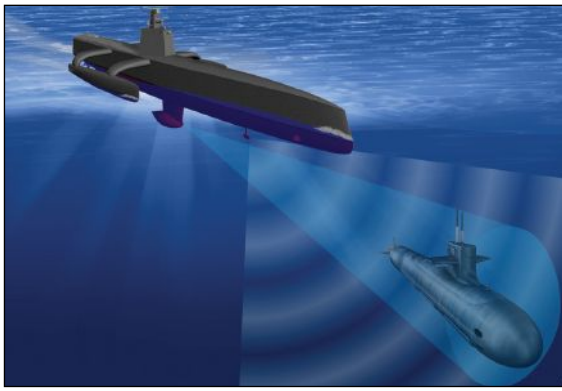
ACTUV sea trials set for early 2016

The Anti-Submarine Warfare Continuous Trail Unmanned Vessel (ACTUCV), under development by the Defense Advanced Research Projects Agency (DARPA), is expected to begin builder's trials in January or February.

The unmanned surface vessel is designed to track and trail submarines, but is also being eyed for other tasks.

Scott Littlefield, program manager of its DARPA's Tactical Technology Office, said, "The Navy is considering using this [the ACTUV] for a variety of missions," Littlefield said, including mine countermeasures.

He said using the ACTUV would cost about $15,000 to $20,000 per day, compared with a destroyer that costs about $700,000 per day to operate. He



said that other advantages of the ACTUV concept include greater payload and endurance than a ship-launched unmanned surface vehicle, the ability to launch from and recover at a pier, and the elimination of the need to integrate the system with a ship.

The 132-ft long, 140-ton ACTUV is being built by Leidos at the Vigor Shipyard [formerly Oregon Iron Works] in Clackamas, Oregon. The vessel is about 90% complete. The hardware of the systems is complete, with software being engineered presently.

For more information, visit www.darpa.mil.

OCEANEERING®

CONNECTING WHAT'S NEEDED WITH WHAT'S NEXT™

NEEDED: A subsea connection specialist with a strong safety performance record.

NEEDED: The ability to understand job requirements and identify the most effective and cost-efficient solutions.

NEEDED: Niche, best-in-class products, services, and solutions to solve subsea challenges, from routine to extreme.

NEEDED: Nimble and responsive execution of solutions to minimize risks and optimize productivity.

As the trusted subsea connection specialist, we focus intently on the many challenges that global offshore operators face—from routine to extreme. To meet those needs, we first ask, "how can we do this better?" Then we leverage our vast experience working in dynamic and unconventional environments to solve beyond the status quo. The results are innovative solutions that safely de-risk operational systems, increase reliability, and enable a lower total cost of ownership for our clients.

Connect with what's next at **Oceaneering.com/WhatsNext**

OFFSHORE INDUSTRY

in this section

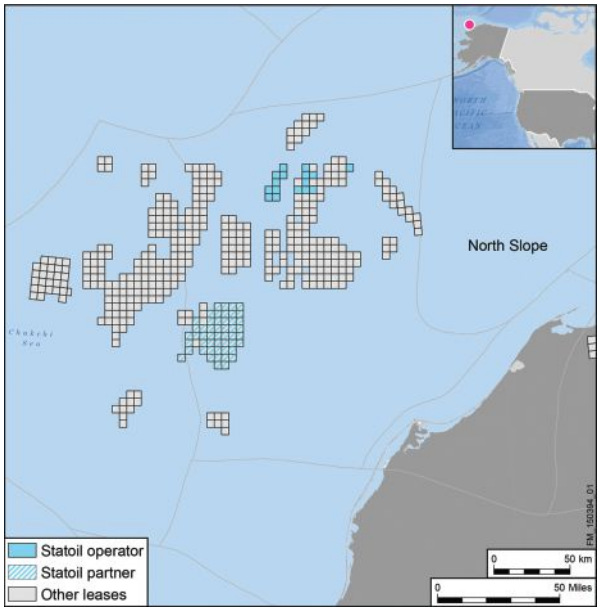
Offshore Industry Headlines 33
Upstream Oil & Gas 36
Underwater Intervention 44
Maritime Communications 50
Subsea Cables 56

Statoil exits Alaska

Statoil is optimizing its exploration portfolio and has decided to exit Alaska following recent exploration results in neighboring leases.

Statoil is committed to optimizing its portfolio, strengthening financial performance, and positioning for long-term value.

The leases in the Chukchi Sea are no longer considered competitive within Statoil's global portfolio, so the decision has been made to exit the leases and close the office in Anchorage, Alaska.



"Since 2008, we have worked to progress our options in Alaska. Solid work has been carried out, but given the current outlook we could not support continued efforts to mature these opportunities," says Tim Dodson, executive vice president for exploration in Statoil.

The decision means Statoil will exit 16 Statoil-operated leases and its stake in 50 leases operated by ConocoPhillips, all in the Chukchi Sea. The leases were awarded in the 2008 lease sale in Alaska and expire in 2020.

Increased understanding

The studies, research and activities that have taken place in Alaska have given the company significant skills and expertise that can be leveraged in other opportunities in northern environments in the future.

"Our understanding of the challenges and opportunities has increased considerably over the last years. This gives Statoil a unique position and experience, which the company will continue to apply going forward," says Dodson.

Fugro performs offshore survey program in Equatorial Guinea

Fugro has been awarded a contract by Ophir Equatorial Guinea (Block R) Limited for the provision of survey services for the development of large-scale assets and infrastructure offshore Equatorial Guinea.

Under the contract, Fugro will deploy three of its specialist vessels—Fugro Searcher, Fugro Scout and Fugro Frontier—to perform autonomous underwater vehicle (AUV) surveys as well as geotechnical, environmental and metocean surveys.

The 65-m high spec. survey vessel, Fugro Searcher, is one of three specialist vessels deployed by Fugro on the contract at the Fortuna Project.

Fugro Searcher

The significant survey program will take place at the Fortuna Project to the west of Bioko Island, where Ophir is planning a large FLNG installation and associated subsea structures. With the surveys beginning in November, the offshore operations are scheduled for completion in January 2016.

API statement regarding Obama administration decision to cancel 2016 and 2017 Arctic oil lease sales

The API Director of Upstream Erik Milito released the following statement regarding the Obama administration's decision to deny Arctic offshore development extension requests and scheduled 2016 and 2017 Arctic lease sales:

"Our industry's strong interest in developing our country's vast offshore oil and natural gas resources in Alaska was undermined years ago when the administration began implementing a system of regulatory and permitting unpredictability and uncertainty."

"Investment decisions have been directly thwarted by the policy decisions of the administration related to Alaskan Outer Continental Shelf development, and lease extensions are clearly justified under the circumstances. And while it is not surprising that Interior canceled the remaining lease sales because there was an absence of nominations, it is the significant regulatory uncertainty that has created the reluctance on the part of our industry. Still, America's oil and natural gas industry remains firmly committed to the long-term development of offshore Alaska resources."

"Arctic oil and natural gas represent incredible potential for American energy security, jobs and revenue for the government. Access to the region's oil and natural gas resources will remain necessary to provide energy supplies to meet the world's growing demand and vital to keeping America's status as a world leader in energy."

API represents all segments of America's oil and natural gas industry. Its more than 625 members produce, process, and distribute most of the nation's energy. The industry also supports 9.8 million U.S. jobs and 8 % of the U.S. economy.

DNV GL helps the petroleum industry to cut emissions

The amount of climate gases emitted per produced unit is increasing, despite efforts over many years to make oil and gas production more efficient. DNV GL is now leading a common industry project on behalf of the Norwegian Oil and Gas Association that aims to enhance energy management, energy efficiency and the exchange of experience and expertise between companies even further.

Increasingly, the oil and gas industry is searching for cost-effective solutions that also cut emissions. Fourteen operators on the Norwegian Continental Shelf are actively participating in this project through seminars and work meetings where they learn about each other's challenges, opportunities and solutions. The project has also revealed that the industry has made important steps forward. The goal is to further develop and share best practices so that the industry can become even better in the future.

"CO_2 emissions per produced unit in Norway are among the lowest in the world and about half the level compared to the global average. This is of course also helped by the reservoir qualities, nevertheless, this project has revealed substantial benefits that can be gained from collaboration and knowledge sharing," says Liv Hovem, director of Division Europe and Africa, DNV GL Oil & Gas.

Energy efficiency is an area where the oil and gas industry can achieve great impact, with both environmentally and financially sustainable solutions. Hovem also pointed out that oil and gas have a lot to learn from other industries. "Other industries, for example in the maritime sector and refineries, have introduced initiatives that have led to substantial financial savings and emission cuts."

Many of the measures identified in the project use a systematic approach to run the facilities optimally without additional investment. For example, gas turbines operate at a higher efficiency because the loads are planned better.

"The experience gained from the project indicates that there is still a great need for innovation. By challenging the way in which facilities are operated through a risk-based assessment, we can safely challenge current practices," says Hovem.

There are still many ways to reduce climate gas emissions in the petroleum industry without incurring major investment costs.

• Compare fields with similar characteristics to identify efficiency opportunities. This can also be done across industries. For example, in the refinery sector, the implementation of the ISO 50001 Energy Management System contributed to energy savings of Euro 3.2 million per month (around NOK 25 million).

• Smart data solutions that extract operational data, analyze operational patterns and identify the reasons for optimal energy operations.

• Operational assessments in a strengthened energy culture where established practice and comfort zones are evaluated to achieve better solutions. The goal is continuous improvement over time so that the facilities are constantly better run. This includes topics such as the better utilization of pressures and temperatures in the process, energy wastage, condition-based maintenance and monitoring the loads on rotating equipment.

"DNV GL has helped other industries to cut emissions and achieved good results, as the example from the refinery sector shows. We are confident that this project will do the same for the oil and gas industry," concludes Hovem.

The depth of innovation overcoming challenging elements to achieve subsea success

Some 20% of the remaining UK oil reserves are expected to be west of Shetland, a challenging environment on the surface and subsea.

In February 2013, Bibby Offshore was awarded a contract by Premier Oil to provide subsea support during the installation phase of its Solan field development project in Block 205/26a of the UK Continental Shelf in 135 m water depth.

The facility at the Solan field has been designed to produce a flow rate of 28,000 bbl/d, peaking at up to 35,000 bbl/d across a 20-year lifeline.

The production facility has been developed as a not permanently manned installation (NPMI) and will be operated remotely from an onshore control room in Aberdeen. The topsides facility supports produced fluid separation, gas treatment, all necessary utilities and power generation.

The field infrastructure also includes a 10,000-tonne subsea oil storage tank (SOST) capable of storing 300,000 bo. Produced oil is sent to the SOST before being exported, via a single anchor loading system (SAL), to shuttle tankers.

Bibby Offshore was brought in to perform installation of the subsea infrastructure and, recognizing the challenging environment, came up with a plan to minimize downtime caused by short weather windows.

Preparation is key

To mitigate the impact of this, Bibby Offshore completed detailed weather analysis prior to mobilization to allow a realistic expectation on the potential downtime that could be experienced. The project team also gathered regular forecasts from various sources to help build an accurate picture in the short term on how the weather would impact over a 2 to 5 day window.

Bibby Polaris on location at Premier Solan.

Bibby Offshore was also able to take a flexible multi-vessel approach to the project, making use of several of the vessels in its fleet. The Dive Support Vessel (DSV) Bibby Polaris was used extensively to complete much of the dive works. The DSV Bibby Sapphire, DSV Bibby Topaz, and the Construction Support Vessel (CSV) Olympic Ares also made a significant contribution to the project. Further to this, the company used short-term chartered Remotely Operated Vehicle Support Vessel (ROVSV) and a third-party DSV.

This multi-vessel approach helped Bibby Offshore tailor the various vessel capabilities to the technical challenges presented by the development and the flexible timeline required to complete the task in line with the client's program. Crucially, it also helped to prevent any schedule slippages in order to maintain progress towards achieving first oil.

A phased approach

The subsea aspect of the project was planned in two phases. Phase one saw the Olympic Ares carry out installation activities for the single anchor loading system (SAL), metrology, lay through spool removal, flexible and umbilical installation and wet storing of fabricated spools. Phase two consisted of the diving support operations to complete installation, tie in, stability/protection and recommissioning of the flexible, umbilicals, spools and storage tank.

Each phase of the project had its own challenges. Due to adjustments in the schedule, Bibby Offshore successfully change managed the scheduled fleet workloads to accommodate its client's requirements, resulting in the project becoming multi-phased with, as mentioned previously, additional vessel support.

During the campaign, a 72-in. structure pile was installed that required a large 90 ton 'Fast Frame' to be deployed to the seabed. The loading hose itself presented a range of engineering considerations to the project team due to the inflexibility of the product and the fact it could not be pre-installed on a deployment reel onshore prior to installation on this occasion.

After completing the acoustic metrology, the Bibby Polaris was deployed to connect the pipeline to the SAL spool and the SAL to the offloading hose.

During the offshore operations, the project team configured an optimized deck layout on the Olympic Ares, thus creating the required working space. This was necessary due to a multi-reel drive system taking up a significant amount of deck space and also the additional equipment required to install flexible and umbilical products before completing metrology between the newly installed platform and subsea oil storage tank. In subsequent campaigns, two DSVs and one ROVSV were mobilized to carry out spool installations, flexible and umbilical tie-ins, mattressing and general storage tank works.

Bibby Offshore's track record meant it was ideally positioned to execute the work. However, this particular project posed a number of environmental and installation challenges that allowed the company to demonstrate further its all-round subsea project management and execution capabilities.

Airborne oil & gas awarded contract offshore West Africa

Airborne Oil & Gas has been awarded a contract for the supply of TCP Downline, Jumpers and deployment system for acid stimulation.

A West African operator selected Airborne Oil and Gas's Thermoplastic Composite Pipe (TCP) technology as the preferred solution for injecting large volumes of stimulation fluids offshore in deep water offshore West Africa. Airborne Oil & Gas will supply a 1,450-m long, 3-in. ID 5000 psi working pressure TCP Downline and TCP Jumpers, the latter connecting the downline to the injection skid and subsea wellhead. In addition, Airborne Oil & Gas will supply the complete deployment spread, including reeler, tensioner and all pipe ancillaries such as end fittings, bend restrictors etc. Airborne Oil & Gas will perform all related engineering including global dynamical analysis of the downline system.

The TCP Downline and TCP Jumpers provide the high flow rates required for effectively stimulating reservoirs. Acid stimulation is a key element in the EOR strategy of most operators; where the flow rate is a prerequisite, the good fatigue performance, lightweight and easy maintenance ensures a good business case compared to alternatives such as steel-coiled tubing.

"Following the other orders that Airborne Oil & Gas won recently, on downlines and acid stimulation systems, this most recent order is clear evidence of a growing acceptance of TCP technology in the offshore industry, and of our leadership position in the acid stimulation and intervention business", says Martin van Onna, Airborne Oil & Gas's chief commercial officer. "We are working with all of today's leaders in the field of intervention, stimulation and plug and abandonment and see a strong growth over the coming period. Cost- effective intervention is key to enhanced oil recovery for subsea wells. Especially in these times, where cost reduction is a central theme for many operators, our technology provides new ways to increase recovery ratios in the most cost efficient manner."

Aker solutions wins maintenance and modifications contract from BP in Norway

Aker Solutions won a framework agreement to provide maintenance and modifications services at BP-operated oil and gas fields offshore Norway.

The contract has a fixed period of 5 years valued at as much as NOK 3.2 billion. It also contains options to extend the agreement by as many as four years. The accord starts on 1 December 2015 on expiration of an existing agreement for similar services.

"This contract was won in stiff international and national competition and will help secure jobs on the west coast of Norway as well as provide crucial support for our development of operations further north," said Per Harald Kongelf, head of Aker Solutions in Norway. "We're very pleased to continue our strong partnership with BP on the Norwegian shelf."

The agreement is for work on the North Sea fields Ula, Tambar, Hod and Valhall as well as the Skarv deposit in the Norwegian Sea. The work will be managed and executed by Aker Solutions' maintenance, modifications and operations units in Stavanger and Sandnessjøen and at the company's fabrication yard in Egersund.

"Aker Solutions is a very experienced and capable supplier that has over many years had large and demanding deliveries to BP both in development projects and in the production phase," said Eldar Larsen, vice president of operations for BP in Norway. "The company has shown great flexibility and willingness to develop and use local businesses, which is especially important for activity in Sandnessjøen."

Aker Solutions has worked with BP in Norway for more than 20 years and signed the first long-term framework agreement contract of this type with the company in 1999.

"We look forward to continuing the constructive relationship we've developed over the years with BP as we work together to find the most cost-effective solutions for these fields," said Knut Sandvik, head of Aker Solutions' maintenance, modifications and operations business.

Statoil awards contracts for two Johan Sverdrup jackets

Statoil - Statoil ASA.

On behalf of the Johan Sverdrup license, Statoil is awarding contracts for two Johan Sverdrup jackets to Kvaerner Verdal and Dragados Offshore S.A.

The contract awarded to Kvaerner Verdal has a value of approximately NOK 1 billion and covers engineering, fabrication and construction of the steel jacket for the Johan Sverdrup processing platform. Weighing 17,700 tons, the jacket will be constructed at the yard in Verdal and installed on the Johan Sverdrup field in the summer of 2018.

"This is the third delivery based on the letter of intent signed by Statoil and Kvaerner for delivery of jackets. This means that Kvaerner will deliver three of four jackets for the first phase of the Johan Sverdrup development," says Kjetel Digre, senior vice president for the Johan Sverdrup development project.

"Having documented learning and synergies in connection with existing contracts, Kvaerner has become the supplier of these three jackets and will contribute to improved competitiveness and maximized value creation from Johan Sverdrup," says Digre.

The contract awarded to Dragados Offshore S.A. covers engineering, fabrication and construction of the steel jacket for the Johan Sverdrup utility and accommodation platform. Weighing 7,600 tons, the jacket will be constructed at the yard in Cadiz. Field installation is scheduled for the summer of 2018.

"We are pleased to include Dragados Offshore in the Johan Sverdrup project, which is a complex puzzle requiring precision and quality in all deliveries. We have good experience with Dragados Offshore from construction of the jacket for the Statoil-operated Mariner project. We are looking forward to resuming our good cooperation, and from day one we will focus on utilizing our experience and ensuring the same quality in this Johan Sverdrup assignment," says Digre.

The investment costs in the first phase of the Johan Sverdrup development are estimated to be in the order of NOK 117 billion (2015 value) with expected recoverable resources in the range of 1.4 to 2.4 Bboe. The ambition is a recovery rate of 70% for Johan Sverdrup. The first phase of the Johan Sverdrup field development will consist of four installations, including a utility and accommodation platform, a processing platform, a drilling platform and a riser platform, as well as three subsea water injection templates. The platforms will be bridge-linked.

The Johan Sverdrup field partners: Statoil 40.0267% (operator), Lundin Norway 22.6%, Petoro 17.36%, Det norske oljeselskap 11.5733% and Maersk Oil 8.44%.

The Reliable source for Deepwater Subsea Fabrication Jumpers - PLETs - PLEMs - Suction Piles

NEW INDUSTRIES

www.newindustries.com

6032 Railroad Ave.
Morgan City, LA
985-385-6789

Cambla secures first decommissioning contract wins

International project services consultancy, Cambla, heralds its move into the decommissioning sector, having been awarded contracts with two major operators in the oil and gas industry.

The contracts will see Cambla provide expert project services support and utilize its specialist Schedule Animation Tool (S.A.T) software to ensure efficient and effective planning for decommissioning projects in the North Sea.

Alexander MacLeod, founder of Cambla, said: "We are delighted to have secured our first decommissioning contracts, which have been awarded as a result of the excellent reputation we have built with the operators on previous projects. Decommissioning is now high on the agenda for many companies in the energy industry and we are delighted to have established ourselves as project services experts in this sector."

Cambla has also expanded its services by providing its first interim in-house consultancy service for another major operator. The work scope will involve the provision of a project services in-house consultant for asset planning.

Alexander continues: "The wide scope of work required for these contracts allows us to deploy various elements from our pre-built toolbox of processes and reports to save clients time and costs, in the implementation of a robust planning system."

"We continually strive to broaden our service offering and the provision of an interim in-house consultant highlights our ability to support large companies in the management of their project planning as well as our capability to provide bespoke solutions tailored to each client's needs."

Established in 2013, Cambla offers expert project planning, cost control and probabilistic services to support oil and gas projects using a pre-built toolkit of processes and reports. Cambla's team of expert project planners support client projects across the globe, from early appraisal through to the final close-out period, ensuring a high quality result is achieved at all stages of the project.

Cambla

ABS classes the world's largest offshore wind farm installation vessel

ABS, the leading provider of classification services to the global offshore industry, has announced that the ABS-classed Seajacks Scylla, the world's largest and most advanced wind farm installation and offshore construction vessel, has been delivered by the Samsung Heavy Industries Shipyard in Geoje, Republic of Korea.

The ABS-classed Seajacks Scylla is the world's largest and most advanced wind farm installation and offshore construction vessel. Photo credit: Seajacks UK Ltd..

ABS, the leading provider of classification services to the global offshore industry, has announced that the ABS-classed Seajacks Scylla, the world's largest and most advanced wind farm installation and offshore construction vessel, has been delivered by the Samsung Heavy Industries Shipyard in Geoje, Republic of Korea.

"Industry growth depends on innovation and new designs," says ABS chairman, president and CEO Christopher J. Wiernicki. "As a technology leader, ABS is pleased to work with Seajacks as it develops and launches vessels with increasingly greater capabilities."

Seajacks CEO Blair Ainslie credits the strong working relationship among the project participants for the successful delivery of this unit. "The cooperation among Seajacks, ABS and SHI was vital to the success of this newbuild effort," he says. "As we bring new designs to the market, we rely on partners who are willing to take on projects like this one that break new ground in the industry."

Based on the Gusto MSC NG14000X design, the Seajacks Scylla, has more than 8,000 metric tons of available variable deck load. Equipped with a 1,540-metric-ton leg-encircling crane and a usable deck space in excess of 5,000 sq. m, the unit is outfitted with 105-m legs with the ability to install components in water depths to 65 m. The rig is capable of meeting the installation needs of jumbo-monopiles, jackets, and turbines of future wind farms in deeper waters farther from shore.

The Seajacks Scylla complies with ABS classification requirements for self-propelled jackup units, including the DPS-2 for dynamic positioning capability; ACCU, which applies to automatic centralized control unmanned units; and CRC for crane register certificate.

Since 2009, Seajacks has invested in five self-propelled jackup units, all of which have been classed by ABS. The Seajacks Scylla represents a milestone for the company as it is considered to be the most technically advanced installation vessel in the market.

Ocean Rig considers cold stack for units off contract

Ocean Rig UDW Inc. has started work offshore Angola with the Olympia and was expected to move the rig to the Ivory Coast for one well in the fourth quarter 2015 before returning to Angola to complete the contract that runs to June 2016. Ocean Rig said the unit would be cold stacked if no work is contracted beyond that.

The Eirik Raude was in the middle of a six-well contract in the Falklands and expected to be there into January 2016. Beyond that, lacking any prospects for use, Ocean Rig has said the unit will be cold stacked and other options examined, including disposal or scrapping. The same fate awaits the Leiv Eiriksson once it completes its current contract this coming March, the company said.

The Skyros had begun a new 6-year contract for work offshore Angola, and the Mylos was completing a well off Brazil. Ocean Rig has received a notice from its client of "material breach" of the Mylos contract with the ultimate result of terminating the contract. Ocean Rig has said the "notice is totally without merit and we intend to vigorously defend our rights under the contract."

"For rigs that we cannot secure long-term employment that are coming up for their 5-year SPS we will cold stack the units and in the case of the semi-submersible rigs seriously consider all our options including disposal or scrapping," said George Economou, Ocean Rig's chief executive officer.

Partners agree to revised rates for wells off Senegal

Cairn Energy and its partners have executed contracts for use of the Ocean Rig Athena drillship for a new campaign offshore Senegal. The drillship, under long-term contract with Cairn's partner ConocoPhillips, was in Angola and expected to soon begin its mobilization to Senegal.

Ocean Rig Athena is a new seventh-generation, dual derrick, dynamically positioned drillship (Enhanced Saipem 10000 design) delivered in March 2014. It began a 3-year drilling contract for ConocoPhillips offshore Angola in June 2014.

According to FAR, another of the Senegal partners, ConocoPhillips has an option to extend the duration of the contract by 2 more years beyond the cut-off date of May 2017.

The Ocean Rig Athena.

The day rate for the Senegal joint venture was adjusted downward to reflect prevailing market conditions. Day rates have dropped by up to 50% for deepwater drilling units offshore Africa, FAR said.

The firm three-well program includes two appraisal wells on the deepwater SNE-1 oil discovery, plus coring and testing, and one exploration well to further evaluate the shelf area all to be completed by mid-2016.

SNE-2 and SNE-3 were to be drilled first with the aim of attaining the threshold of reserves needed for an economic field development of around 200 mmbbl, according to FAR. The third well, BEL-1, will be on the Bellatrix prospect, mapped by FAR to contain a potential 168 mmbbl of oil.

GMS Scirocco contracted for offshore construction

Gulf Marine Services said its newbuild self-propelled self-elevating support vessel (SESV) GMS Scirocco was completed ahead of schedule and under budget. The vessel was to begin a 3-month contract (extendable by up to 1 month) for an EPCC contractor working for an unnamed national oil company in the Middle East-North Africa (MENA) region.

GMS Scirocco is the second of a new SESV design, the mid-size class, in the company's fleet. A third, GMS Sharqi, is due to be delivered early next year, followed by an additional large class vessel, GMS Evolution, in the fourth quarter of 2016.

The company builds all its SESVs, also known as jack-up barges, at its quayside facility in Abu Dhabi. The current newbuild program, which began last year, will increase the fleet from 9 to 15 vessels by the end of next year.

Meanwhile, Topaz Energy and Marine said it acquired two subsea vessels from Vard Brattvaag in Norway at a purchase price of approximately $115 million. Developed for light subsea construction with intervention duties, the vessels will be of VARD 3 08 design and are scheduled for delivery in the second half. The DP-2 class vessels will have a 120-ton active heave compensated offshore crane. Topaz retains an option for two more vessels.

The jack-up drilling rig Emerald Vantage.

Ophir spuds Soy Siam well offshore Thailand

The jack-up Emerald Vantage has started a two-well exploration drilling program for Ophir Energy in Block G4/50 in the western Gulf of Thailand. Initial well G4/50-10 is targeting the 25-mmbbl Soy Siam prospect.

The block partly surrounds Ophir's producing Bualuang oil field and spans various Tertiary sub-basins. Both wells will investigate whether there is a working hydrocarbon system in the previously undrilled South Western sub-basin. Ophir considers the main play risk to be charge, specifically source distribution and maturity.

Soy Siam is a single fault block that may have been charged from both the Bualuang and the South Western sub-basins. The G4/50-10 well was to test Miocene sandstones equivalent in age to the producing reservoirs in the Bualuang oil field, 34 mi to the north.

Next, the rig will drill the Parichat South West prospect. The Parichat complex is a cluster of four fault blocks 18.6 mi south of Bualuang that have potentially been charged from deeper in the South Western sub-basin.

Each fault block has multiple stacked Miocene and Oligocene reservoir targets. The initial target is the southwest fault block with prospective resources of 25 mmbbl. If this well is successful, the Parichat South East fault block would provide an immediate follow-on exploration location. Ophir said the two wells will cost around $18 million and take roughly 50 days to complete.

Global partners MacArtney and Moog Focal expand long-term business alliance

MacArtney has accepted responsibility for the in-field sales and after-sales support of Focal products in the commercial marine markets of the northwest region of North America via its office located in Victoria, BC in Canada.

Moog Focal Technologies Corporation and the MacArtney Group have agreed to intensify their multi-service partnership aiming at expanding their long-term business cooperation in favor of their extensive customer portfolio.

Representing a wealth of marine experience and knowledge and having many years of experience attending to Focal products, the MacArtney Group considers the strengthening of their Focal business relations quite essential. An increase in global sales and servicing capacities fortifies the foundation for a strong business alliance between the two companies.

Trained MacArtney Inc. technicians servicing a Focal slip ring.

Local sales and service support across North America

MacArtney Inc., a member of the international MacArtney Underwater Technology Group, was founded in 1995 and is headquartered in Houston, Texas.

Today, MacArtney Inc. operates a number of separate sales offices in strategic locations across North America, offering an extensive product portfolio focusing on system solutions, after-sales service and maintenance to the offshore oil and gas, ocean science, marine renewables, and navy and defense markets.

Products & services

Apart from a broad range of underwater technology products, MacArtney Inc. is specialized in local service and global support providing repair, maintenance and service of slip rings, sonars, TV systems and fiber optics, providing a 24 hour service. A large stock of standard SubConn® connectors for immediate delivery is also available.

Expro enters Qatar with 5-year contract

International oilfield services company, Expro, has achieved a significant milestone as it enters Qatar for the first time and expands its Middle Eastern presence with a 5-year contract win.

The contract will see Expro provide its range of well intervention and slickline services including high deviation and heavy-duty fishing offshore Qatar, as well as in drilling and workover locations in-country.

Tarek Hekal, senior area manager – Middle East, said: "This contract is a key win for Expro in the region as we expand our presence to better serve our clients."

"In current market conditions, Expro recognizes the need for operators to lower production costs. We will work closely with operators in the region to bring planning, operational and technical expertise that adds real commercial benefit to the cost of intervention."

For the financial year ending 31 March 2015, Expro's presence in the Middle East and North Africa region grew with stronger positions in all its main operating countries, providing the opportunity to introduce a range of new technologies, products and services into these markets.

STATS Group plugs gap in Malaysian pipeline isolation market

Pipeline technology specialist STATS Group has seen a sharp upswing in demand for its Remote Tecno Plug isolation technology in Malaysia.

In the last 9 months, STATS has completed seven pressurized pipeline isolation projects on behalf of a major oil exploration company facilitating the safe and efficient replacement of 17 valves.

The onshore and offshore projects, which have been completed on the Malaysian Peninsular and in Sarawak, deployed STATS' DNV GL type approved Remote Tecno Plugs ranging in size from 24 to 32 in.

Established 17 years ago, STATS Group works in all major oil and gas producing regions across the globe and has extended it's original North Sea operations to encompass bases in Canada, USA, and the Middle East.

STATS technicians awaiting deployment of Remote Tecno Plug.

The company believes its success in the Malaysian market will act as a springboard for further contract wins in Asian and Australia and will strengthen their commitment to the region by establishing an operational base in Labuan and a technical support and sales office in Kuala Lumpur.

Ron James, sales director, said: "This has been our busiest period in Malaysia and with all projects delivered on time and within budget, we have a strong base for consolidating our position in the region.

"Our track record is established for providing safety critical isolation services that enable urgent maintenance work to be completed, within schedule and with minimal outage to production.

"There is huge potential to introduce our Remote Tecno Plug isolation technology to the broader Asian and Australian onshore market building on the success we have enjoyed in Malaysia."

Songa Offshore SE: Cat D update

As previously announced on 15 July 2015, Songa Offshore received notices of arbitration from DSME in respect of the construction contracts for the Cat D rigs.

On 16 November 2015, Songa Offshore received claim submissions from DSME related to Songa Equinox, the first Cat D rig, in which DSME asserts a claim of USD 179 million, along with a request for repayment of liquidated damages in a total amount of USD 22 million. The claim that is asserted relates to alleged cost overruns and additional work in relation to the Songa Equinox rig due to what DSME alleges were inherent errors and omissions in the design documents (as often referred to as the FEED package).

Songa Offshore has performed an initial review of the claim and does not consider that there is any substance to the claims asserted by DSME. The company is confident of its position, since it is of the view that DSME is responsible for the delays and any attempt to recover cost overruns is of no merit due to the "turn-key" nature of the construction contract. Songa Offshore has obtained legal opinions from highly reputable law firms in the UK and Norway and from a Queen's Counsel all of which confirm the company's position.

Further details will be provided as and when appropriate.

The miniCTD range

Perform your measurements both quickly and accurately

- Designed for fast and accurate profiling of Conductivity, Temperature and Depth
- Optional integrated Fluorometer
- Bluetooth or Cable communication options
- Quick change single D cell battery
- Depth rating options of 500m and 6000m

VALEPORT in our element

Tel: +44 (0) 1803 869292
sales@valeport.co.uk
www.valeport.co.uk

ACCS REGISTRARS ISO 9001 ACCS REGISTRARS ISO 14001

Jackup players collaborate to increase reliability and reduce cost in new DNV GL JIP

Lack of properly assessed and defined wear limits for jacking systems can lead to significant downtimes with financial implications for jackup operations. DNV GL, supported by leading global industry players in the jackup industry, has established a joint industry project (JIP) to provide guidelines on determining relevant wear criteria for self-elevating units.

The "wear acceptance criteria for jacking systems" JIP, is expected to begin early 2016 with 11 partners already confirmed. The JIP is building on a DNV GL Recommended Practice (RP) issued last year to address maintenance and inspection challenges of a jackup system. It will document relevant design arguments, considerations and calculations to enable the industry defining acceptance criteria and giving guidance on the correct assessment of jacking systems in a RP.

"Defining maximum limits of wear across all parts of a jacking system is technically complex," says Michiel van der Geest, product manager offshore classification, DNV GL – Maritime. "It not only involves the interaction of all elements of the system, including the different materials applied, but also relevant operational and maintenance strategy considerations.

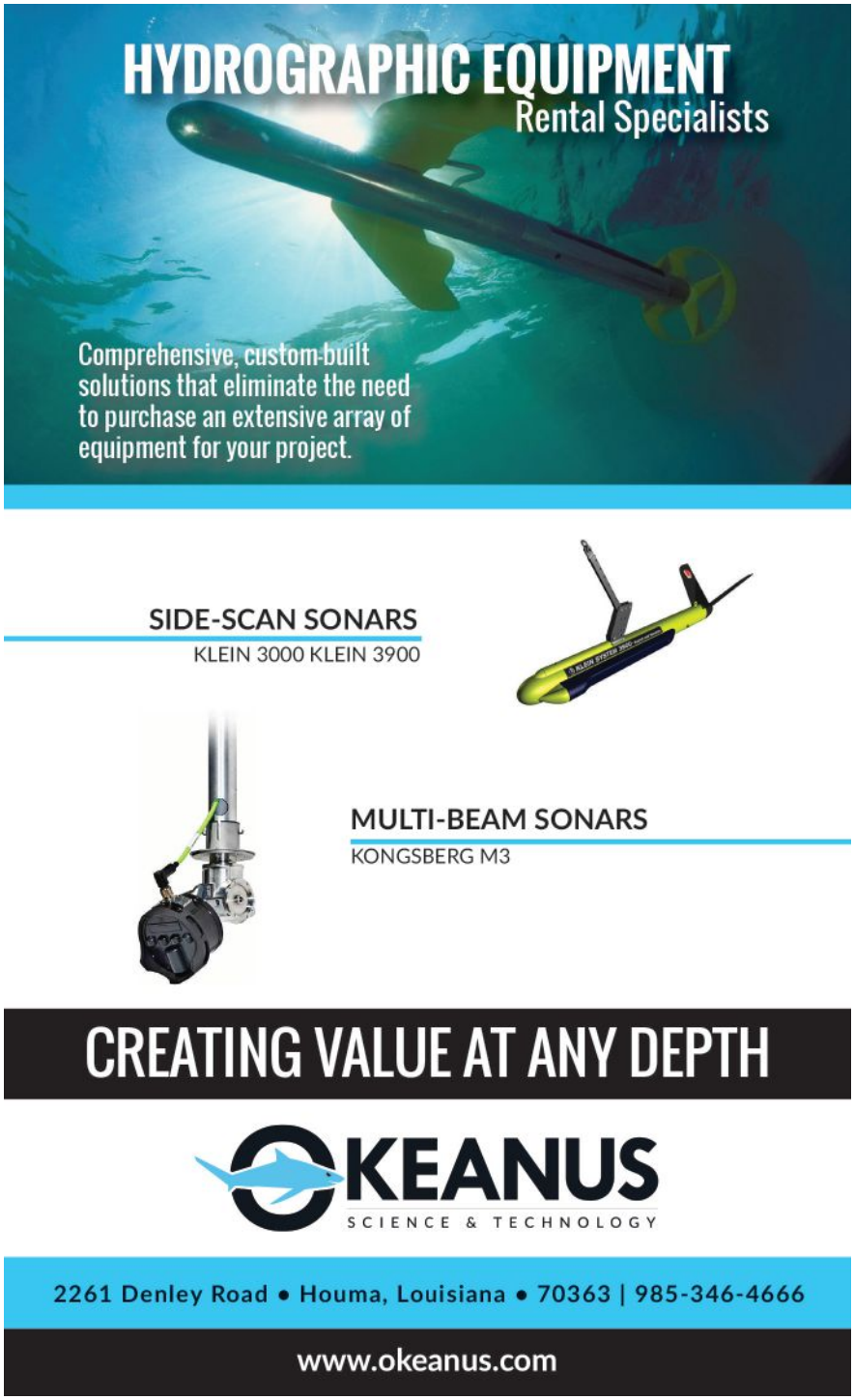
Incorrect or unclear assessments can increase cost and also the reliability and availability of jacking systems. By creating a clear guidance, this JIP will ultimately improve asset management and reduce delays and maintenance costs.

Several partners have expressed the need for this JIP: "There is a clear benefit in participating in this JIP, taking into consideration the need of users, class authorities, and OEM to have a common language when talking about jacking systems. The recommended practice which will be issued from this JIP will give the users confidence in long term predictive operation, supported by OEM diagnosis," says Philippe Gadreau, chairman and CEO of NOV-BLM.

Another partner adds: "Allrig is delighted to extend its participation in this next phase of the JIP and continue to share its extensive knowledge of jacking systems best practice," says Mark Hannigan, CEO, Allrig Group. "Through collaborations of this nature the offshore industry as a whole can emerge from the downturn stronger, safer and more efficient to face the challenges of the future."

Thomas Burley, CEO of David Brown Gears, comments: "David Brown Gears has received strong support from our growing customer base in the UAE to participate in the DNV GL JIP on jacking system wear criteria. We believe that the JIP offers the right forum to define best practice for the industry."

"This new JIP on wear acceptance criteria for jacking systems is the latest offspring from our successful collaborative initiatives to improve jackup operations," adds Michiel van der Geest. "We are constantly looking into improvements for the jackup industry."



'Virtual dolphins' help make the first trial of marine robotic software a success

Software that could better enable a fleet of robotic vehicles to work together to perform tasks such as seeking and tracking whales and dolphins has been successfully trialled in Loch Earn, Scotland. This software acts like a central brain, making decisions about where the robots should go based on the changing environment around them, which is measured using in-built sensors. The trial was conducted by SeeByte and ASV with support from the National Oceanography Centre (NOC).

The trials are part of a two-phase competition managed by NOC as part of a Small Business Research Initiative. The software was developed by SeeByte and integrated into the robotic autonomous surface vehicle "Thomas", which was developed by ASV and is owned by the NOC.

SeeByte's Neptune software successfully trialled dolphin tracking capabilities by getting "Thomas" to adapt its course in response to virtual dolphins. These were part of a computer simulated environment that was "layered" onto the real environment of the Loch to enable the software to be tested against specific scenarios. The vehicle also performed a survey of an area of the Loch to track a geological feature. During this survey the Neptune software was able to modify the course of Thomas if it strayed too far from the feature. Neptune already forms the basis of UK Maritime Autonomy Framework. However, it has been extended as part of this project to allow robotic vehicles to perform specific behaviors.

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

Michigan State Police upgrades deepwater capability with Iver3 AUV

OceanServer Technology has recently delivered an Iver3-580 AUV to the Michigan State Police Underwater Recovery Unit. The AUV system operates at depths to 200 m and includes EdgeTech's 2205 high resolution side scan sonar.

OceanServer has sold over a dozen systems to customers in the Great Lakes Region including four systems to the University of Michigan and one Iver3 system shipped to Michigan Tech University in 2013.

The Michigan State Police Underwater Recovery Unit has a lot of ground (water) to cover with thousands of inland lakes and shorelines on four of the Great Lakes. The Iver platform will allow the team to rapidly deploy the AUV not only in shallow water but in depths over 50 m where towed sonar systems and diver operations are far more challenging.

AUVs allow users to program fixed lawn mower style sweeps of wide areas with very little logistical support or cost. The EdgeTech's 2205 sonar system comes with two frequencies (1600kHz/600kHz) to give investigators the option for very fine resolution or wide area survey capability. AUVs are increasingly being called into service for support in underwater forensics and search and recovery operations.

OceanServer president Bob Anderson stated "It is a real milestone to see this critical technology adopted by the State Police, building on years of collaboration with universities in the state. Michigan's investment in this technology will greatly expand the Underwater Recovery Unit's deep water search capability as evidence during the two recent deployments on two open cases."

For more information, visit www.ocean-server.com.

Oceaneering demonstrates innovative remote piloting and automated control

Oceaneering demonstrated two new technologies in the Gulf of Mexico that will greatly increase ROV operational efficiency and reduce costs for its customers.

During the demonstration, the NEXXUS ROV on the Oceaneering Olympic Intervention IV vessel was successfully piloted via a satellite link from an Oceaneering onshore base. The innovative data/video communications technology that enables this capability was originally developed to aid in diagnosing faults offshore by technical support personnel onshore. The technology has been further developed to include the ability to remotely pilot the ROV.

With remote piloting, an infield high bandwidth wireless or satellite link is used so that an ROV can be piloted on an offshore vessel from another remote location. Subject matter experts or other pilots can be linked-in in the event of highly complex processes or technical procedures that require special knowledge. Remote connection technology allows the use of multiple virtual connection technologies and potentially creates cost savings opportunities such as reduction and/or elimination of second shift crewing for low intensity operations.

The demonstration also included an essentially hands-free operation method of piloting, whereby the pilot was able to "fly" the ROV with a command-based system involving automated steps, instead of using the traditional joystick. Using video machine vision technology, the video processing software analyzes video and sends the ROV control system positioning data from the video to control the thrusters and move the ROV. Operators will now be able to use this technology to automate the ROV flight and perform tooling tasks faster and safer, thereby improving productivity and reducing the chance of downtime.

"Computer-aided piloting is much more efficient than a human pilot can achieve unaided, which in turn reduces the potential damage to tooling, manipulators, and most importantly, the customer's subsea assets. This new ROV capability revolutionizes efficiency in the deployment of tools and navigation from point to point," said Kevin Kerins, senior vice president, remotely operated vehicles.

While both technologies were used at the same time during the demonstration, either technology can be used independently. However, pre-programmed automated step piloting eliminates latency problems associated with operating over a satellite link.

For more information, visit www.oceaneering.com.

Triton Submarines announces the deepest-diving, all-acrylic submersible in the world

Triton Submarines LLC, America's leading builder of personal submarines designed for yacht deployment, announced a revolutionary new submersible model at a press conference at the Fort Lauderdale International Boat Show. Triton Submarines CEO L. Bruce Jones unveiled plans for the new Triton 6600/2, which is capable of transporting two people in air-conditioned comfort to 6,600 ft (2,000 m) below the ocean's surface. The new 6600/2 is available for order now.

Although it is similar in appearance to Triton's popular 3300 series submersibles–with hulls that allow passengers to board after the vessel has been deployed into the water–the passenger compartment of the new Triton 6600/2 remains at surface pressure irrespective of diving depth and is engineered utilizing a new technique developed by our acrylic manufacturing partners.

Designed to launch from vessels equipped with suitable deployment systems, the Triton 6600/2 has a maximum 10-hour dive duration, although its life support system will operate for up to 96 hours.

"It should take about an hour for the sub to get down to its maximum depth, but once there, the pilot and passenger will have plenty of time to investigate a wreck or some other artifact on the bottom and shoot video if desired," said Triton Submarines project manager Ron Stamm. "Six 20,000-lumens lights will be standard, but owners will be able to add more if needed to support their video operations."

For more information, visit www.tritonsubs.com.

Seatronics successfully activates world's first P.A.N. disrupter subsea with Predator ROV Elite

Seatronics, an Acteon company, has successfully triggered a Percussion Actuated Non-electric (P.A.N.) disrupter subsea, with its Predator ROV, whilst maintaining station keeping during a live fire mission.

Manufactured and developed by Seatronics, the Predator ROV has been designed to function in all market sectors due to its compact and portable structure, ensuring easy deployment and operation.

Seatronics established the Predator ROV Elite System as a bomb squad capable improvised explosive device (IED) ROV specifically designed to perform demonstrations in conjunction with Great Eastern Group for the U.S. Maritime Bomb Squads. A demonstration of the unit was conducted in April 2015 in response to requirements outlined by the nation's bomb squad community and the Port of Los Angeles and Long Beach Port Dive Operations Group (PDOG).

Initial demonstrations resulted in an invitation for Seatronics to demonstrate the Predator ROV Elite System at the Underwater Post Blast Investigators Course in Bluffton, South Carolina, USA, hosted by the FBI Counter-Improvised Explosive Device Unit, along with the South Carolina Law Enforcement Division's (SLED) Bomb Squad. Attending the course offered the opportunity to demonstrate the Predator ROV Elite System to a variety of Public Safety entities in a real world environment.

For more information, visit www.seatronics-group.com.

ASV C-Worker completes subsea positioning operation in GoM

ASV announces the successful completion of an autonomous surface vehicle (ASV)-supported LBL acoustic positioning array box-in and array baseline data collection operation in the deepwater Gulf of Mexico.

Fitted with a Sonardyne gyro USBL, the C-worker 6 ASV was used to assist in the installation of a 38 compatt array by collecting 11 box ins and all the baselines from the surface at a water depth of approximately 6,000 ft (1,830 m).

The application of this new technology resulted in significant savings by reducing surface support vessel time and increasing program efficiency.

Thomas chance, chairman of ASV, remarked that "the industry is ready for this new approach and sees our ability to support and streamline their operations as a significant benefit going forward."

ASV is a leading provider of unmanned vessels with more than 70 ASV platforms in the field globally and a wide variety of associated payloads. ASV's staff of 65 personnel designs, builds, and operates a range of ASV platforms for industrial, scientific, and military applications worldwide.

For more information, visit www.asvglobal.com.

Ashtead Technology secures exclusive underwater glider agreement

Ashtead Technology has secured a global asset management agreement with Blue Ocean Monitoring to store, maintain and supply underwater gliders for ocean data monitoring.

Blue Ocean Monitoring is a world-leader in the provision of ocean data solutions using autonomous subsea and surface glider technology.

The deal will see Blue Ocean Monitoring expand its service offering globally with Ashtead providing asset management services and project support from its offices in Aberdeen, Houston and Singapore.

Tim Sheehan, commercial director at Ashtead Technology said, "Through this exclusive agreement, Ashtead will hold gliders in each of its bases around the world, from where we will store, maintain and supply them, providing our customers with a new, proven technology solution for ocean data collection.

"The gliders can be equipped with a choice of over 40 different sensors and can be deployed in the water for up to a year at a time. With two-way satellite communications the gliders can be deployed and controlled anywhere in the world, they are highly weather resilient and have no environmental impact."

Oil and gas applications include pipeline leak detection, oil spill response, decommissioning studies, dredge/construction plume monitoring, environmental monitoring and metocean studies.

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

Odyssey Marine Exploration goes to great lengths with Sonardyne GyroiUSBL

New subsea technology that allows geophysical towfish to be tracked at distances far greater than current methods allow has been successfully evaluated by Odyssey Marine Exploration during trials in the Bay of Biscay.

Developed by Sonardyne International Ltd, UK, the Ranger 2 GyroiUSBL system was able to track Odyssey's latest deep tow side-scan platform at a slant range of 7,500 m from their vessel, Odyssey Explorer. Only the depth of the ocean prevented greater ranges being achieved.

Long layback tracking of towfish has traditionally been a major challenge for conventional Ultra-Short BaseLine (USBL) acoustic positioning systems due to the very long slant ranges involved and vessel noise degrading performance. Sonardyne first sought to address this challenge back in 2006, turning the problem on its head to create Inverted USBL (iUSBL).

In normal USBL operations, an acoustic transceiver is fitted to the survey vessel and an acoustic transponder is fitted to the target being tracked. With iUSBL, their positions are swapped; the transceiver is installed on the towfish looking up at the transponder deployed from the vessel. The net result is that the signal-to-noise ratio is dramatically improved, which, in turn, allows long ranges and greater precision to be achieved.

The new Ranger 2 GyroiUSBL system builds on this technique by exploiting the long-term accuracy and precision of acoustic positioning with the continuous availability and fast update rate of high-grade inertial navigation sensors.

Odyssey are pioneers in the salvage of historic, deepwater shipwrecks and rely heavily on side-scan sonars to identify potential targets. The towfish being used during the recent trial has been designed to their exact specification to enable far deeper depths to be explored.

For the test, Odyssey used a high-powered directional Wideband Mini Transponder (WMT) in responder mode mounted to an over-the-side deployment pole from the Odyssey Explorer. This was interfaced via control room hardware to the GyroiUSBL transceiver mounted on the towfish. Power and communications to the GyroiUSBL was provided through a Nexus multiplex fibre optic telemetry system.

With the towfish fully deployed, Odyssey used the GyroiUSBL to passively listen for the WMT's signal in a low noise, dynamically stable subsea environment. This meant that they were able to accurately track the position of their towfish at a previously unachievable slant range of 7,500 m.

Additionally, the acoustic transceiver component of the system incorporated Sonardyne's unique ping stacking technology to provide a tracking update rate of 2 hertz, irrespective of range and water depth.

"The trial went exactly to plan," said Tom Bennetts. "As the layback grew and grew, GyroiUSBL just kept tracking until the ocean depth became prohibitive. Analysis of the signal-to-noise data at the time indicated that we could have tracked to beyond 9,000 m had the winch cable been able to extend further." He added, "Even more impressive was that these ranges were attained using the lower end of the medium frequency band. This means that the multibeam data quality is significantly enhanced due to less in-band interference at the source."

For more information, visit www.sonardyne.com.

UK Met Office trials 'Autonaut' to replace weather buoys

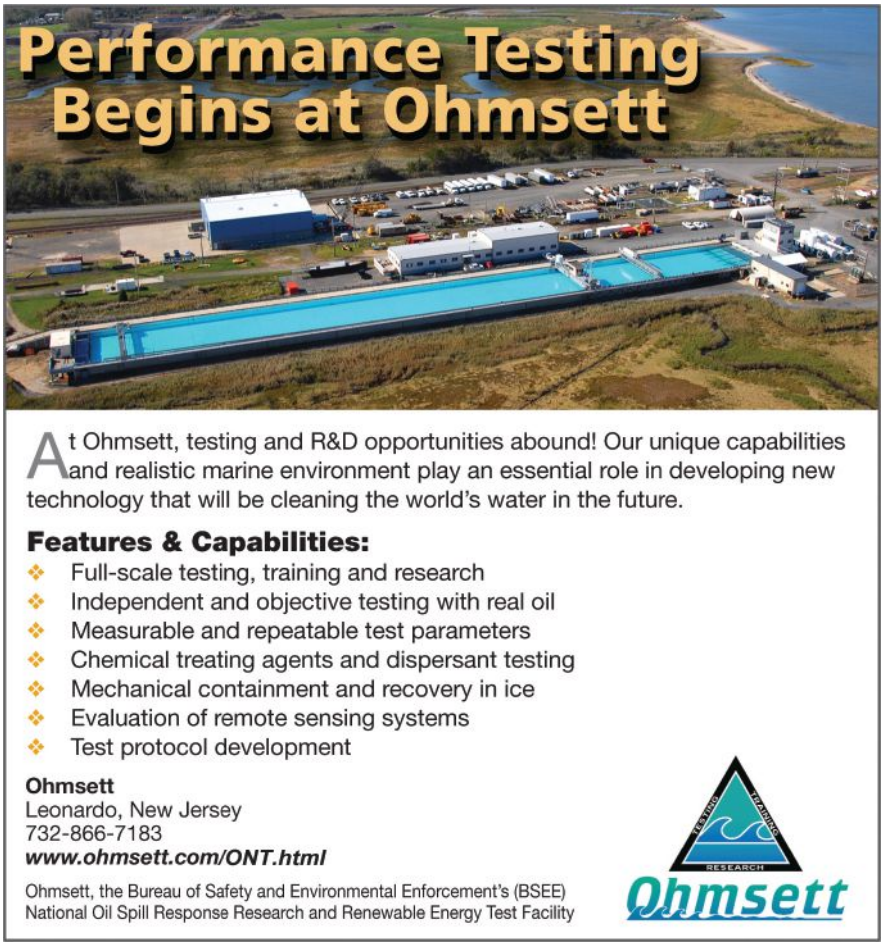
The unmanned surface vessel AutoNaut® has completed a successful trial off Plymouth carrying Met Office sensors. In late November, a suite of weather sensors provided by the UK Met Office put to sea aboard the 3.5-m wave-propelled boat developed by Chichester-based UK company MOST (Autonomous Vessels) Ltd. The aim was test the viability of collecting forecasting data in a new and more cost-effective way.

AutoNaut has a unique wave propulsion system that does not require fuel, and so is able to stay at sea for many months. Controlled via satellite from anywhere in the world with an Internet connection, she can carry a wide range of sensors.

In this case she carried the same sensors as the UK Met Office uses on ocean buoys to provide data for weather forecasting. These include wind speed and direction, barometric pressure, humidity and temperature (both air and sea).

The trial took place over 4 days and nights on the Western Channel Observatory run by Plymouth Marine Laboratories where there are scientific buoys with the same sensors fitted. This will make possible a direct comparison between calibrated data from the buoys and data gathered aboard the AutoNaut.

MOST (AV) had an AutoNaut out for 11 days in the same area last year. It carried a weather station on the mast, but not the same make of sensors as



used by the Met Office, and the trial was not calibrated. The data was encouraging, but not scientifically comparable.

This time the sensors on the buoys were freshly calibrated by the Met Office, working with Plymouth Marine Laboratories, with the aim of providing a validated trial.

A USV like AutoNaut could be preferable to a moored metocean buoy because buoys are expensive to moor and maintain with support ships and in storms they sometimes break free. If AutoNaut can gather the same quality data, it will be possible to collect data for weather forecasting at reduced cost.

AutoNaut can be launched from a beach or slipway and make its own way to the buoy location. Once there it can circle on a 25-m radius until told to return to base for recovery. This means that with a couple of AutoNauts to replace each other on station it will be possible to do all the maintenance ashore, even for buoys moored in the deep Atlantic. This would be another step forward in making practical use of modern autonomous capability.

For more information, visit www.autonautusv.com.

University of Gothenburg acquires leading-edge winch for scientific research

Antarctica expedition benefits from a state-of-the-art ROV winch supplied by MacArtney Underwater Technology. An icebreaking polar supply and research vessel is to map out underwater conditions in the icy waters in terms of subsurface and marine life.

The winch system, which was acquired through Swedish SubSea Solutions on the part of University of Gothenburg, will be put to good use on board South African icebreaking polar supply and research vessel S. A. Agulhas II designed to carry out scientific research and supply to South African research stations in Antarctica. Soon it will be heading for Antartica to carry out various underwater explorations. On board the vessel a MERMAC R10 AHC ROV winch with active heave compensation (AHC) has been installed to ensure dependable and high-quality performance of the studies in question.

The system supplied is an electrically driven winch ensuring robust and advanced handling systems that safely control the launch, operation and recovery of work class and inspection ROV systems. The winch is extremely dependable, offers high performance and is easy to use. Its design is compact and consists of modular systems. Several components are standardised, making it easy to specify, adapt or upgrade to the performance and capacity required.

"To the MacArtney Group, mutual trust and cooperativeness are essential features of succeeding when carrying out cooperation and teamwork with our customers," says MacArtney vice president of sales & marketing Hans-Jørgen Hansen adding, "MacArtney is very pleased to provide quality underwater technology to empower the important scientific ocean exploration that is undertaken by the University of Gothenburg and its marine science partners."

For more information, visit www.macartney.com.

EuroROV chooses Forum Sub-Atlantic as preferred ROV supplier for new training school

EuroROV, the Spanish ROV training and engineering company, has taken delivery of a Forum Sub-Atlantic Mojave vehicle for its newly launched ROV pilot training facility.

The electric ROV, which was manufactured by Sub-Atlantic's parent company Forum, is one of the most powerful observation vehicles of its size. Its compact, ergonomic design and lightweight construction allows rapid set up and deployment using any domestic power supply.

Sebastian Ruggirello, co-founder of the training school, said: "The Mojave is a perfectly balanced small vehicle which is well suited to the training requirements of the students. It is powerful and highly responsive, giving the students an excellent grounding in vehicle control. The subCAN™ control and diagnostics system is an industry standard and familiarity with its operation is of great benefit to the pilot trainees when securing employment."

Sub-Atlantic's global product director, Ryan Lumsden, said: "To employ our Mojave vehicle for training purposes is a huge endorsement of its next generation subsea capabilities and builds on the strong relationship that Sub-Atlantic and Forum have established with EuroROV."

"Electric ROVs have moved on significantly from the days when they were basically flying cameras. Now, they carry out a multitude of tasks due to major advancements particularly in the assortment of manipulators, tooling and sensors they can be fitted out with. Therefore, students at EuroROV's training facility will learn how to use one of the industry's most sophisticated and technically advanced vehicles."

EuroROV has just completed the first course from its new training school, which is based at Girona University.

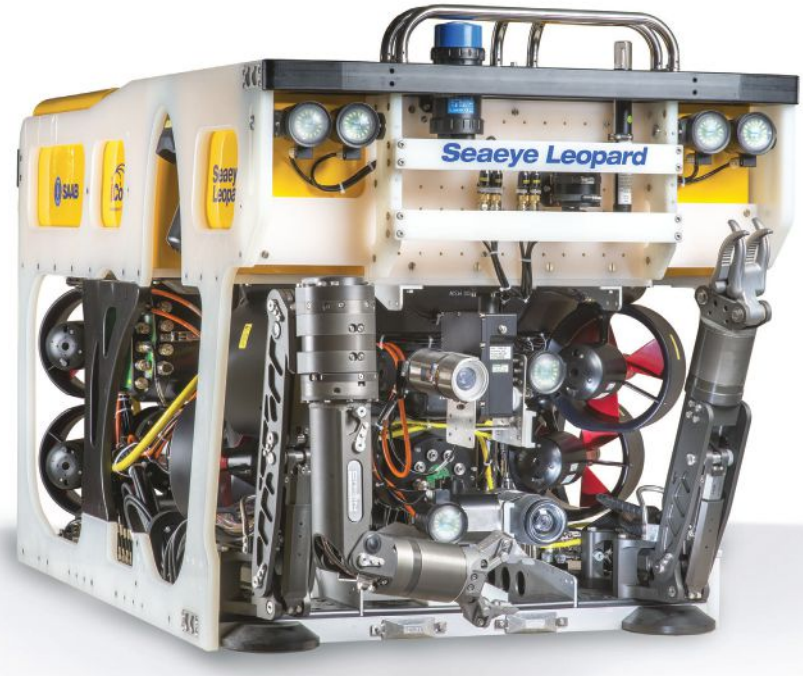
"When I was working as an ROV pilot I could see there was a gap in the skills of many new pilots as they were faced with the challenges of their new position," Ruggirello said. "Many pilots were technically competent in flying skills but lacked in ability to solve practical problems under pressure. The structure of training aims to address these issues by setting the students practical problems to solve."

For more information, visit www.eurorov.com.

UI 2016

Booth 323

Leap into the future



The most advanced compact work ROV ever
- smaller, smarter, stronger

THE WORLD'S LEADING UNDERWATER VEHICLE MANUFACTURER

seaeye.com/leopard

SAAB TECHNOLOGIES

SAAB

Mackay Communications acquires CMC Electronics' commercial marine business

Mackay Communications, Inc. acquired CMC Electronics' commercial marine business on 30 October 2015 from Canadian parent, Esterline, a leading supplier of aviation systems. Esterline divested their marine sector to concentrate efforts on its core aviation business. CMC Electronics' maritime brand traces its roots to the Canadian Marconi Company (CMC), originally the Marconi Wireless Telegraph Company of Canada (circa 1903).

Mackay Communications' Marine Division is a turnkey supplier of communications and maritime electronic solutions and global service. The acquisition of CMC Electronics' commercial marine business mutually complements their product offerings, enhances access to diverse market segments, and provides customers with quality 24/7 services at all major ports throughout North America.

A new regional division, Mackay Marine Canada, will blend Mackay's Vancouver office and CMC Electronics' marine locations, resulting in five Mackay offices in Vancouver (British Columbia), Quebec City (Quebec), Halifax and Yarmouth (Nova Scotia), and St. John's (Newfoundland). Mackay Marine Canada will continue to represent leading brands Canadian customers are familiar with, strengthened by Mackay's worldwide network and extensive portfolio.

The mission of Mackay Communications, Inc. is to provide the most comprehensive quality product portfolio, with industry-leading sales support and seamless 24/7 global service for all classes of high seas, fishing, workboats, government, offshore energy vessels, and land-mobile satellite communications applications. Mackay's Marine Division will close out the year with 30 wholly-owned marine sales and service operations in 15 U.S., 5 Canadian, and 10 additional worldwide locations, with a network of 90+ global service agents.

For more information, visit www.mackaycomm.com.

Videotel's training programs deployed on more than 12,000 vessels worldwide

Videotel™, the leading international provider of e-Learning maritime training and software solutions and a company of KVH Industries, Inc., announced that its training solutions are now in use on more than 12,000 vessels worldwide, with more than 300 new vessels having joined in the third quarter of 2015 alone. A further milestone reached by the award-winning training-program producer is that Videotel has recorded more than 10 million training events in recent years.

In addition, Videotel has recently secured the business of a fleet of 24 vessels from a new offshore vessel client based in the Far East who, despite the current economic downturn, believes good training is absolutely essential for the safe operation of its fleet.

Videotel's success over the years is due in part to its efforts to continually expand its delivery platforms to meet the needs of the maritime industry. For example, Videotel's Basic Training Package of 20 essential maritime training programs is now available with the IP-MobileCast™ content delivery service and through an agreement with Inmarsat.

Earlier this year, Videotel received the highly acclaimed Golden Reel Award from the Media Communications Association-International (MCA-I) in recognition of a training video that Videotel created for ExxonMobil Marine. Videotel has received nearly 100 awards for its training programs and software in recent years.

Videotel recently launched the new print edition of its training catalogue, STCW Maritime Training Catalogue 2015-2017, detailing the complete Videotel selection of 950 new and updated titles available in a range of formats. Videotel's computer-based training (CBT) programs are included, an area that boasts an impressive 500+ e-Learning courses, more than twice the number of CBTs offered by competitors. Also launched at the same time was the latest Videotel on Demand (VOD) release, which includes a total of 59 e-Learning courses–37 new, 22 updated–to meet current seafarer training needs.

For more information, visit www.videotel.com.

Speedcast strengthens position in Asia with acquisition of ST Teleport

SpeedCast International Limited has entered into a definitive agreement to acquire ST Teleport, a leading satellite communications services provider based in Singapore. The acquisition includes ST Teleport's world-class teleport facilities and data center infrastructure in Singapore, a major hub in Asia for global maritime and oil & gas customers. The acquisition enables SpeedCast to remain, more than ever, the partner of choice for satellite communications in Asia-Pacific and further strengthens the Company's position in both the maritime and energy sectors.

Established in 1994, ST Teleport is the leading independent provider of satellite services in Singapore. ST Teleport focuses on maritime, energy, enterprise and media verticals and serves a strong base of local and international customers. As part of its work servicing offshore companies, it has obtained various certifications for quality, environmental, health and safety standards and has a team of experienced and certified engineers supporting its customer base. ST Teleport prides itself on its ability to connect businesses seamlessly and reliably through a diverse network of satellite systems and terrestrial network infrastructures.

Singapore is widely recognized as a strategic hub for communications services in Asia-Pacific, and in particular for the energy and maritime sectors. With this new acquisition, SpeedCast significantly strengthens its presence in Singapore to serve its growing customer base there. It also extends SpeedCast's global network with a state-of-the-art facility and infrastructure in a strategic location in Asia. The infrastructure further complements the teleports acquired by SpeedCast earlier this year in Australia through the NewSat acquisition. SpeedCast's customers will benefit from being able to land their traffic in Singapore, co-locate equipment there, leverage a stock of spare parts, and take advantage of an offshore certified engineering team, as well as a 24/7 customer support center. The associated lab will also allow customers to test applications and do live proofs of concept on site.

ST Teleport's hybrid satellite-fiber infrastructure supports access to more than 22 satellites and direct connections to fiber switches in Asia and in the U.S., facilitating an extensive reach in global content and data distribution. Services for maritime and oil & gas customers represent a significant percentage of ST Teleport's business, and will further enhance SpeedCast's position in these two important sectors.

The acquisition of ST Teleport is subject to regulatory approval. This is the fifth acquisition announced by SpeedCast in 2015.

For more information, visit www.speedcast.com.

Ericsson, Inmarsat sign agreement to transform the future of the connected ship

Inmarsat and Ericsson have signed a strategic maritime agreement that is intended to facilitate the sharing of cargo, logistics and vessel operational data to help streamline the maritime supply chain.

The two companies will jointly develop services, solutions and applications to drive industry standards for satellite connectivity and application integration in the maritime industry.

As a first step, Ericsson has signed a distribution contract to offer XpressLink, Inmarsat's combined L-band and Ku-band VSAT network for the maritime market. XpressLink offers an easy upgrade path to Inmarsat's Fleet Xpress service, powered by the new Global Xpress constellation, when it becomes available in the coming months. It is intended that the distribution agreement with Ericsson will be extended to Fleet Xpress at that time.

The new strategic relationship will also pave the way for integration between Ericsson's Maritime ICT Cloud and global connectivity delivered over Inmarsat's satellite communications network, including both Ka and L-band.

Ericsson's Maritime ICT Cloud is an end-to-end managed cloud solution that connects vessels at sea to shore-based operations including maintenance service providers, customer support centers, fleet/transportation partners, port operations and authorities. Enabled by Inmarsat, the Maritime ICT Cloud will ensure that trucks will spend less idle time at ports, cargo will spend less time in transit, and producers will be better able to plan their shipments.

An example of how the strategic cooperation agreement works in practice was highlighted with the recent announcement of a contract between Ericsson and U-Ming Marine, a leading shipping company specializing in the transportation of cement, dry commodities and industrial raw materials. Ericsson will provide U-Ming Marine with end-to-end connected vessel and voyage optimization solutions, including satellite connectivity from Inmarsat.

Ronald Spithout, president Inmarsat Maritime, said, "With Fleet Xpress, the world's first mobile hybrid Ka/L-band high-speed broadband service, embedded in and enabling world-class solutions from Ericsson, we are re-defining maritime connectivity. This transformational agreement will open up opportunities for vessel operators and managers to capture intelligent data immediately.

For more information, visit www.ericsson.com.

KVH upgrades IP-MobileCast service to enhance viewing experience

KVH Industries, Inc., has updated its unique IP-MobileCast content delivery service for additional viewing flexibility and expanded content offerings. The new features are being rolled out in stages, with the first round of upgrades automatically delivered via over-the-air software updates for current subscribers. IP-MobileCast was developed by KVH and launched in 2014 as the first and only service to multicast movies, TV shows, daily news and sports, as well as operational data via satellite to vessels at sea. Survey estimates indicate content has been viewed more than 100,000 times by subscribers, setting a benchmark for maritime multicast entertainment.

The first IP-MobileCast enhancement released includes the availability of subtitle languages for movies. This is an important option, given that seafarers hail from the Philippines, India, Eastern Europe, Greece, Japan, Russia, the United Kingdom, and many other countries. Subtitled movies complement IP-MobileCast's video and print news content, which is available in dozens of languages. These offerings are designed to address the reality of multinational crews on today's merchant vessels and charter yachts.

Another IP-MobileCast upgrade already completed is the release of an enhanced viewing experience, including more accessible menus and program guides on the vessels' set-top boxes, making it easier for viewers to find and select the content they want. As a further convenience to seafarers, selected news content is available via the IP-MobileCast app for Android and iOS, so crewmembers can read news delivered directly to their smartphone or tablet. In addition, an update will soon make all IP-MobileCast content viewable on virtually any device onboard—from the ship's common-area computer or television to smartphones, tablets, and laptops.

KVH's expertise in identifying desirable content stems in part from the years of experience that the U.K.-based KVH Media Group has had in producing news and in licensing movie, TV, and sports content. On IP-MobileCast, the content is available under the brand names NEWSlink, MOVIElink, TVlink, and SPORTSlink.

To further meet the maritime industry's needs, KVH has joined with leading maritime partners to deliver critically important operations content such as weather data, updated global chart databases, and training programs via IP-MobileCast to vessels at sea. Multicast delivery of this content, which previously could only be provided to vessels in port via physical delivery of CDs or DVDs, is transformational in both affordability and timeliness.

For more information, visit www.kvh.com.

Marlink to supply BP Shipping with improved high-speed broadband

Marlink will provide BP Shipping with global multi-band high speed VSAT services to support operational efficiency and crew communication across its tanker fleet. Under the new contract, Marlink will deliver primary communication capability on its flexible Sealink VSAT service, including MSS (Mobile Satellite System) back-up to BP's operated fleet.

BP Shipping was one of the first operators to adopt maritime VSAT services across its tanker fleet. The company's current operated fleet will migrate to Sealink Ku-band VSAT. BP's existing vessels will retain their C-band VSAT antennas, enabling Marlink to deliver a true multi-band broadband service with high availability of connectivity globally. The use of dual antennas on BP's new build vessels will increase availability of services further when operating close to structures that may obscure line of sight to the satellite.

Sealink Ku-band VSAT will provide global access to much higher guaranteed bandwidth than currently available on its C-band VSAT alone, with even higher burstable rates. This will provide a higher speed data communication link to support business critical IP applications such as Condition Based Maintenance, significantly reducing equipment servicing costs. In addition to providing data rates at a CIR (Committed Information Rate) of 512 kb down and 256 kb up as standard for business and operational needs, Sealink VSAT will become the carrier for BP Shipping's existing voice calling system.

Marlink's compression solution will further enhance web browsing and file transfer performance and its web control solution will help to avoid unwanted bandwidth consumption by blocking access to (user-defined) specific websites and restricting bandwidth-consuming services, while giving priority to legitimate Internet usage.

"BP Shipping was the first tanker fleet to use Sealink VSAT services 13 years ago and we are proud that BP Shipping places its trust again in Marlink as a partner and VSAT pioneer," said Tore Morten Olsen, CEO in Marlink. "Through Marlink's own infrastructure, we will deliver a high bandwidth data link and global support, leveraging our entire organization to ensure BP Shipping's tankers can further improve operational performance and are supported remotely and locally by our expert engineers."

For more information, visit www.marlink.com.

RigNet to provide VSAT for Gulf of Mexico production platforms

RigNet, Inc. has been awarded a 5-year contract to connect two deepwater tension-leg production platforms (TLPs) in the Gulf of Mexico via a resilient satellite and wireless network.

In a first for the offshore oil and gas industry, RigNet will deploy an O3b Networks low latency, high-throughput medium Earth orbit VSAT solution to deliver voice and data services to a TLP operating at a depth of 4,375 ft in Green Canyon block 653 in the Gulf of Mexico. Satellite connectivity will be shared via microwave link with another TLP in a neighboring block 8 mi away. The second TLP will maintain a second geosynchronous VSAT connection as well to add failover capability to the networked platforms.

"Integrating O3b Networks' high-throughput VSAT solution into this production platform network enables RigNet to provide a degree of performance typically associated with a terrestrial connection, without the infrastructure commitments of fiber links,"

said Mark Slaughter, RigNet's CEO and president. "Low latency, high-throughput VSAT service is a key network element to support the growing demands of knowledge management and remote monitoring applications in the offshore production space."

"Drillers and operators have trusted RigNet to deliver innovative communications solutions in the Gulf of Mexico and beyond for a number of years," said Hector Maytorena, group vice president, managed services. "This important win in turbulent market conditions demonstrates our ability to create networks that meet challenging performance and resiliency goals for deepwater production facilities."

For more information, visit www.rig.net.

Ericsson transforms maritime fleet management for Taiwan's U-Ming

Ericsson has been selected by U-Ming Marine Transport Corporation (U-Ming), a marine transportation company headquartered in Taipei, Taiwan, to deliver end-to-end connected vessel and voyage optimization solutions.

Ericsson's Maritime ICT Cloud will enable U-Ming to collect near-real-time data on vessel location and movement and to monitor vessel speeds against manually set planned speeds, allowing the company to optimize fuel consumption. By facilitating real-time information flows, the solution will improve visibility from ship to shore and support process automation, which will reduce U-Ming's costs and deliver efficiencies both internally and for clients and partners.

In addition, Ericsson will deliver its Connected Vessel offering, which will support high-quality ship-to-shore VoIP and email communications for personnel on board vessels.

Under the terms of the agreement, Ericsson will manage day-to-day operations and maintenance of the solution, along with initial installation and integration.

Jeff Hsu, senior vice president, U-Ming Marine Transport Corporation, said, "The implementation of Ericsson's fleet management system will help U-Ming Marine Transport elevate our communications systems, enhance our crew's well being and safety, and improve fuel efficiency. Our partnership with Ericsson will ensure U-Ming maintains its drive to be the most operationally efficient and eco-friendly shipping company we can be. I am looking forward to the partnership and to applying Ericsson's ICT capabilities to our business."

Chris Houghton, head of region North East Asia, Ericsson, said, "U-Ming choosing Ericsson's Maritime ICT Cloud is another proof that the Networked Society is taking off. The combination of mobility, broadband and cloud can help every industry realize its full potential. This end-to-end solution combines Ericsson's global capabilities with our maritime domain expertise, and we look forward to working together with U-Ming."

Ericsson already supports Maersk Line, the world's largest shipping company, with end-to-end systems integration, deployment and management of mobile and satellite communication for its fleet of 400 vessels. This agreement with U-Ming represents Ericsson's first bulk carrier deal globally.

For more information, visit www.ericsson.com.

World's first MilSatCom/Global Xpress maritime terminal

Inmarsat announced a new partnership with EM Solutions to develop the world's first combined MilSatCom/Global Xpress (GX) maritime satcom terminal. The new terminal is scheduled to receive full Inmarsat accreditation during Q2 2016 and will be submitted for Wideband Global Satcom (WGS) certification.

The new terminal, which is initially being created for an Australian Government customer, will contain a number of innovative features, including tracking via monopulse technology and easy switching between GX and MilSatCom systems. The terminal will also be substantially lighter, lower cost and faster than any comparable MilSatCom device.

Based on its land mobile terminal for the Ka-band, EM Solutions is also contracted to deliver a simultaneous X-band/Ka-band maritime terminal for another customer, which provided the baseline reference for the new programme in conjunction with Inmarsat.

EM Solutions has adopted an innovative approach to the development of its satellite terminals, adopting monopulse tracking techniques that provide exceptional accuracy and stability in addition to reducing the demand on motors and other moving parts, which minimises power, weight and operational stress.

As a specialised developer of RF components and subsystems for the Satcom industry, the new terminals will use EM Solution's Diamond Series Ka Mulitband Block Up Converters, which utilise the latest in Gallium nitride (GaN) technology and cover both commercial and military Ka frequency bands in a highly efficient, single package.

This family of maritime terminals is known as the COBRA series and will be further developed for other capabilities in the near future.

Rickmers chooses Marlink VSAT for entire fleet

Rickmers Group has chosen Marlink Maritime VSAT (Very Small Aperture Terminal) services for its fleet of 90+ vessels including container ships, bulk carriers and heavy lift vessels. Rickmers decision to migrate to multiband VSAT from Marlink was based on improving operational efficiency through better integration of ship and shore side networks in addition to providing internet connectivity for crew welfare.

High bandwidth availability on Marlink's Ku-band 'Plus' maritime VSAT services will enable Rickmers to significantly enhance on board IT opportunities while introducing the possibility of live monitoring, tele-medicine and remote access from shore to ship, supporting various energy efficiency initiatives across the fleet. With Marlink Maritime VSAT, Rickmers will also be positioned to enhance communication facilities for crews, through availability of high quality Internet access.

As an international provider of services for the maritime industry, a vessel owner and an ocean freight carrier, Rickmers works with many of the world's leading maritime transport companies. By choosing Marlink VSAT and deploying modern IP applications designed to deliver cost-savings and

improved performance management for vessels, the Group improves its ability to meet customer requirements by providing reliable and cost-effective services in a very competitive market.

Marlink's service suite is a key enabler of Rickmers' energy efficiency strategy aimed at improving operational efficiency and reducing emissions. Rickmers will specifically focus on achieving better energy efficiency by extracting data from on board machinery including main engines and auxiliary equipment, which will support improvements in vessel performance and fuel usage.

Roll-out of a combination of Marlink Maritime VSAT services with data quota or dedicated CIR (Committed Information Rate) across the Rickmers' fleet, which operates primarily in Europe & Asia, started in August 2015. In addition to the on board VSAT hardware, all vessels will have new MSS (Mobile Satellite Services) terminals installed for unlimited back-up communication. L-band back-up solutions are a standard feature of the multi-band approach of Marlink Maritime VSAT Plus services, which also include readiness for migration to Ka- and Ku-band HTS services such as Inmarsat Fleet Xpress and Intelsat EPIC.

XChange, Marlink's innovative service delivery platform, will allow Rickmers to manage and control its communications networks on board as well as from shore. XChange supports IT staff in significantly reducing the time needed for infrastructure administration. Rickmers will also use Universal Remote Access (URA) on XChange for remotely accessing ICT equipment on its ships.

For more information, visit www.marlink.com.

Ceragon and Statoil renew their frame agreement for 5 more years

Ceragon Networks Ltd., the #1 wireless backhaul specialist, announced that Statoil ASA, the largest Norwegian Oil & Gas operator, has formally awarded Ceragon Networks a 5-year frame agreement, with an option to extend for 5 consecutive 2-year periods. Most recently, Statoil has placed orders for Ceragon's IP-20 platform. Ceragon has a longstanding relationship with Statoil and a large existing installed base, which is part of the backbone of Statoil's offshore communications network.

Ceragon offers Statoil an end-to-end solution for offshore wireless communications. The Ceragon PointLink solution's proven performance, including ultra-high capacity and renowned reliability and range, has been used by Statoil to build reliable broadband connectivity despite the North Sea's unpredictable environment for over four decades. With its high-power, offshore coated radios and gyro-stabilized antennas the Ceragon solution provides smooth communications with high bandwidth and low latency. Moreover, the solution allows operators to balance high gigabit capacity with operational efficiency and ensure a reliable network.

Ceragon is the world's largest supplier of stabilized systems for safe operation on any floating vessel. Ceragon is the only vendor to have an in-house ATEX-certified wireless backhaul solution and is also the only vendor who has supplied systems from 0.6 m up to 3 m diameter for very long offshore links. Earlier this year, Ceragon and Statoil established the world's longest link to an offshore platform, connecting the Statoil Rio de Janeiro office to Peregrino–a 174-km long microwave hop–delivering Statoil a bandwidth of up to 500 Mbps.

For more information, visit www.ceragon.com.

ABB commissions cable to power Goliat field

ABB has successfully commissioned a subsea power link for oil and gas company Eni Norge that will supply power from the Norwegian grid to the new Goliat Floating, Production, Storage and Offloading unit (FPSO). The 105.5-km subsea power cable system is the longest of its kind in the world.

The Goliat field, located in the Barents Sea above Norway, is the northernmost oil field in the world. It will process up to 100,000 bbl/d and store nearly 1 mmbbl, which will then be transferred to shore by tankers.

ABB's high-voltage alternating current (AC) three-core cable system includes a 104-km long static cable section on the seafloor, and a 1.5-km long dynamic cable section. The high power rating enables an increased energy supply if needed to provide power for additional fields in the future using the same cable system. The 75-MW, 123 kV capacity link will supply about 50% of the platform's electricity needs from shore, cutting carbon dioxide emissions by half as a result of reduced fossil fuel consumption in the gas turbines. ABB's turnkey solution includes the design, engineering, supply, installation and commissioning of the cable system.

The dynamic cable section hangs in the water between the platform and the seabed and has been specifically designed to withstand substantial mechanical stress and fatigue caused by currents, waves and the vertical movement of the platform. An important feature of the solution is an innovative corrugated metal sheath for this section, designed to withstand the rigors of time.

"Reliable shore-supplied power from the mainland grid will help to reduce the Goliat platform's environmental impact and ensure a safe and efficient operation," said Patrick Fragman, managing director of ABB's Grid Systems business, a part of the company's Power Systems division. "This is another example of ABB's constant quest for innovation and reinforces our position as a global leader in high-voltage cable technology."

ABB's rugged high-voltage polymeric XLPE (cross-linked polyethylene) submarine cables minimize electrical losses and have excellent tensile strength, making them ideal for harsh marine environments. The cable also has integrated fiber optics to monitor temperature and provide general communication services. ABB has commissioned more than 25 direct current (DC) and hundreds of AC cable links around the world, including power links to oil and gas platforms in the Persian Gulf and North Sea.

For more information, visit www.abb.com.

SEA-ME-WE 5 lands in Indonesia

Telkom Group, as one of the consortium member in Southeast Asia – Middle East – Western Europe 5 (SEA-ME-WE 5) cable system, landed the submarine fiber optic cable at its cable landing station in Puak Dumai Beach on 19 November 2015.

The SEA-ME-WE 5 system stretches approximately 20,000 km, connecting 16 countries: Indonesia, Singapore, Malaysia, Myanmar, Bangladesh, Sri Lanka, Pakistan, UAE, Oman, Qatar, Djibouti, Saudi Arabia, Egypt, Turkey, Italy, and France. The cable system is developed with capacity of 24 Tbps using 100G technology. It is expected to be ready for service in November 2016.

Telkom Group's participation in SEA-ME-WE 5 consortium will strengthen its position as a global operator. It is a participant in other consortia, such as Batam Singapore Cable System (BSCS), Dumai Malaka Cable System (DMCS), Asia America Gateway (AAG), Singapore Japan Cable System (SJC), Southeast Asia-United States (SEA-US), Sulawesi Maluku Papua Cable System (SMPCS), and Indonesia Global Gateway (IGG), which will soon be developed.

SEA-ME-WE 5 is a consortium of 19 global telecommunication operators: BSCCL (Bangladesh), CMI, CTG, China Unicom, Djibouti Telecom, du (UAE), Ooredoo (Qatar), Orange (France), MPT (Myanmar), Telin, Telkom, STC (Saudi Arabia), Singtel, SLT (Sri Lanka), Telecom Italia Sparkle, TM (Malaysia), TTI (Turkey), TWA (Pakistan), and Telecom Egypt.

Global Marine re-enters power market

Global Marine Systems Limited is re-entering the submarine power cable market after a brief absence. As of 16 November 2015, Global Marine will once again be available to offshore renewables and power market customers, bringing power and fiber optic connectivity to their systems. In fact, the company is already celebrating its first contract win, an inter-array project at the Wikinger offshore wind farm in German waters, which is due for completion in 2016-17. The placement of the order is a demonstration of the confidence in Global Marine's proven heritage in the power market, both for offshore wind farm installations and subsea power and interconnector installation projects, in which the company has history dating back to 1987.

Despite Global Marine's 3-year absence from the power market, the company can boast numerous successes in a series of landmark projects. For instance, in the past 15 years, Global Marine has completed subsea cable installations at wind farms off the coast of the UK as well as several sites in waters close to the Netherlands, Germany and Denmark. In 2002, for example, the company installed 64 km of cable at Horns Rev, Denmark, Europe's first commercial wind farm.

Global Marine was responsible for installing and burying power cables up to 2 m below the seabed and making 160 cable connections for the wind farm's 80 turbines. Similarly, 3 years later, Global Marine installed the cables for the UK's first commercial wind farm at Kentish Flats, an array of 30 turbines off the coast at Herne Bay. More recently, the company has worked on a number of notable wind farm projects, including London Array, Thornton Bank and Global Tech 1.

Today, Global Marine's customers can benefit from the company's vessel, C.S. Sovereign, which is equipped with a pair of powered 2,300 ton "basket" turntables. These are designed to operate at a linear speed of 900 m/hour, thus optimizing the cost-efficiency of cable-laying.

Beyond the offshore wind sector, Global Marine has a long and successful history in power cable installation. The company is able to provide testimony regarding a number of completed high-profile contracts, including platform-to-platform, shore-to-platform and shore-to-shore projects.

For more information, visit www.globalmarinesystems.com.

First phase of tidal array cabling project hailed a success

The first phase of a major project to investigate cost-effective methods of cable laying for tidal energy arrays has been hailed a success. Funded by Scottish Enterprise, the £2.4 million tidal array cabling solution project was launched in December 2013 to develop and demonstrate effective methods of locating, securing, protecting and retrieving cables for tidal energy arrays.

Aquatera Ltd was one of a number of companies that took part in the initial concept development stage of the project in 2014, subsequently being awarded a contract to undertake two demonstration projects. The first of these, completed in partnership with subsea engineering and training firm, Jee Ltd, involved the construction and deployment of Jee's unique 'U-tube' cabling protection structure in Orkney.

The Aquatera role involved lifting, moving, positioning and recovering the 50-m long Jee cable protection system–thought to be the largest single dimensioned structure yet lifted, moved and placed for the wave and tidal sector. Tests of this innovative array cabling solution were carried out at the European Marine Energy Centre's Shapinsay Sound tidal test site.

Several support companies from Orkney's marine energy supply chain also played a key role in the project, which saw a unique and novel configuration of local vessels used to install the 50-m long structure. The vessel spread used included a specialized heavy-lift barge–belonging to Stromness firm Green Marine–along with a tow vessel and MulticCat provided by Green Marine and a second MultiCat vessel operated by Scotmarine. These vessels were supported with a quayside duel crane lift by Heddle Construction. Management of the marine operation by Aquatera was backed up by Orcades Marine.

Aquatera's Daniel Wise, who managed the operation, said the project partners were delighted with the outcome of the first phase of tests. "Cable laying in other energy sectors and industries has traditionally been carried out by large and expensive offshore dynamic positioning (DP) vessels," said Mr. Wise.

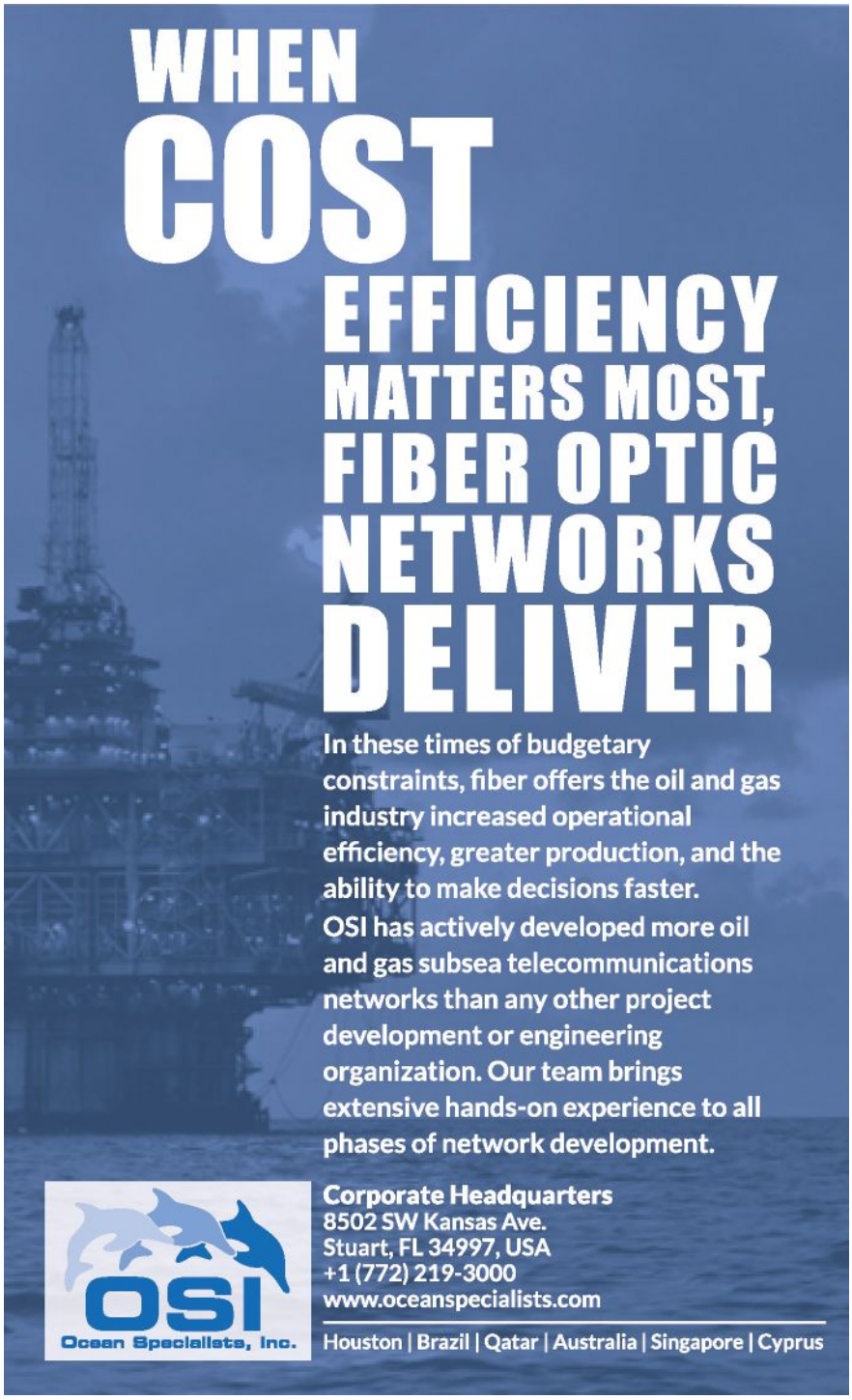
For more information, visit www.aquatera.co.uk.

ACE starts work on Sao Tomé-Cape Town segment

Orange, together with the other members of the Africa Coast to Europe (ACE) consortium, announces the start of the next phase of the ACE submarine cable system to expand broadband connectivity and digital services in Africa.

For Phase II, the ACE submarine cable system is being extended to South Africa: a 5,000-km extension from island of Sao Tomé & Principe, in the Gulf of Guinea, to South Africa that will further strengthen the role ACE is playing in critical infrastructure development in the continent.

Today, nearly 12,000 km of fiber optic cable are already used to connect 18 countries: France, Portugal, the Canary Islands (Spain), Mauritania, Senegal, Gambia, Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Benin, Ghana,



Nigeria, Equatorial Guinea, Gabon, and São Tomé & Príncipe. Two landlocked countries, Mali and Niger, are connected via a terrestrial extension.

When Phase II is completed, ACE will cover a total distance of 17,000 km and will allow up to 25 countries to access high-speed internet.

ACE uses the most advanced high-speed broadband fiber optic technology; wavelength division multiplexing (WDM) allows the capacity to be increased as and when it is needed without additional submarine work being required. Overall capacity will be boosted to 12.8 Tbps using 100-Gbps technology, which supports high-capacity networks.

The consortium has invested around US$700 million in the construction of the cable, which includes US$250 million from the Orange Group and its subsidiaries.

Through these major investments, Orange confirms its commitment to provide widespread access to the Internet in the close to 20 African countries where the Group is present and to continue to improve the quality of its network service.

For more information, visit www.orange.com.

Aqua Comms announces completion of transatlantic cable

Aqua Comms Limited has completed the final splice of its America Europe Connect (AEConnect) subsea fiber optic cable system completing the marine segment. Scheduled to be ready for service by 31 January 2016, AEConnect spans more than 5,536 km across the Atlantic with strategically placed stubbed branching units to facilitate future extensions of the system. The system provides secure, low latency, high capacity connectivity from New York to Dublin, London and beyond to greater Europe.

Envisioned to revolutionize connectivity between North America, the United Kingdom and Europe, Aqua Comms' AEConnect is one of the first subsea cables constructed between New York City and London in nearly 15 years. Featuring the latest technology of 130 Gbps x 100 Gbps per fiber pair, it is specifically designed to meet the growing bandwidth requirements demands of global data centers, carriers, cloud-based networks, financial services market participants and content providers. With more than 52 Tbps of available capacity, the 100G-compliant system will utilize innovative optical technologies to provide the most advanced subsea system, combined with a control plane based on a Software-Defined Networking (SDN) technology to serve bandwidth-intensive applications.

TE SubCom, a TE Connectivity Ltd. company and an industry pioneer in undersea communications technology, dedicated three vessels to the surface-lay, burial and post-lay inspection of the AEConnect subsea cable, including the cable ships Reliance, Decisive and Responder, with the former executing the final splice. The AEConnect system is designed to provide the most secure transatlantic cable system in existence.

On both the U.S. and European sides, the cable transverses the minimum length of shallow water along the continental shelf, while additional armoring and deeper burial was obtained. The cable also avoids major fishing grounds and shipping anchorage areas that are known to expose subsea cables to damage. In addition to its highly secure routing, AEConnect delivers one of the lowest latency crossings of the Atlantic.

For more information, visit www.aquacomms.com.

Alcatel-Lucent, Bluesky Pacific Group launch new Pacific system

Alcatel-Lucent Submarine Networks has signed a turnkey contract with Amper, SA subsidiary Bluesky Pacific Group to roll out a new submarine cable system spanning more than 9,700 km across the Pacific.

Named Moana Cable, the system will link New Zealand and Hawaii using the latest submarine cable technology, providing much-needed capacity and redundancy in the region to address increased traffic requirements as mobile broadband and the provision of fiber access to homes and businesses take center stage in the region.

With completion scheduled in 2018, the Moana Cable system will have two main segments: the first segment, based on two fiber pairs, will connect New Zealand to Hawaii over 8,000 km, serving Samoa and American Samoa and significantly enhancing route diversity for New Zealand; the second segment, based on one fiber pair, will link the Cook Islands to the Samoa hub over 1,700 km.

The Moana Cable is also designed to accommodate the connection of additional Pacific island nations such as Niue, Tokelau and Tonga, which lie in close proximity to the New Zealand-to-Hawaii trunk, as well as French Polynesia.

The Moana Cable will be the first long-haul submarine cable in the Pacific islands region relying on the latest innovative 200 Gbit/s transmission technology, with ultimate capacity between Hawaii and New Zealand of 20 Tb/s.

Bluesky Pacific Group has a strong track record as a submarine cable owner and operator with its ASH Cable connecting American Samoa to Hawaii and SAS Cable connecting Samoa to American Samoa. Anchor customers of the Moana Cable include Bluesky Pacific Group companies and existing ASH Cable customers. Bluesky has also signed a memorandum of understanding with RAM Telecom International, Inc, for collaboration and interconnection with its SEA-US submarine cable linking Asia to Hawaii and the West Coast of the United States. This technology partnership will enable the Moana Cable to provide unrivalled connectivity from New Zealand and the Pacific to the U.S. and Asia.

Under the terms of the contract, ASN will deploy its advanced submarine optical technology based on the innovative 1620 SOFTNODE and OADM branching units to maximize capacity and network flexibility. ASN will be responsible for the project on a turnkey basis, from system design to installation and commissioning, as well as marine operations (cable laying and maintenance).

For more information, visit www.alcatel-lucent.com.

ICPC holds inaugural workshop in Indonesia

On 18 November 2015 in Yogyakarta, Indonesia, a pioneering joint workshop was held by the Coordinating Ministry for Maritime Affairs of the Republic of Indonesia and the International Cable Protection Committee (ICPC) regarding submarine telecommunication cables in Indonesia. These cables are of vital social and economic importance as they underpin the Internet and over 98% of trans-oceanic communications and data transfer. Submarine cables are also a key component of Indonesia's critical infrastructure as submarine cables provide the ideal means to connect the nation's thousands of inhabited islands.

The workshop featured an innovative approach to define, discuss, and recommend practical means to enhance the attractiveness for Indonesia to become an important international communications hub, while at the same time bringing sustainable connectivity and reliable communications to even greater island populations within the world's largest archipelagic nation.

ICPC presenters provided insights into the factors that would lead investors and submarine cable owners and operators to decide on a selection of routes and landing locations for international cables. The presentation included information and data on how Indonesia was viewed in this context. Indonesian government presenters commented on the challenges facing Indonesia in terms of competing domestic regulatory issues. Other presenters reviewed the rights and obligations regarding submarine cables as set out in the United Nations Law of the Sea Convention (UNCLOS) and the submarine cables in the marine environment and natural hazards impacting Indonesia. UNCLOS provides the legal framework for the oceans and is supported by over 166 countries including Indonesia. The 10 articles in UNCLOS that address submarine cables are a major reason for the universal success of submarine cables in the modern digital economy.

For more information, visit www.iscpc.org.

ADB supports submarine cable for Samoa

The Asian Development Bank (ADB) has approved a $25 million grant for a submarine cable project that will support the development of a fiber-optic cable system linking Samoa to Fiji's international submarine cable network, giving Samoa fast and affordable Internet access. Co-finance is being provided by the World Bank and the Government of Australia.

ADB's grant sourced from ADB's concessional Asian Development Fund will be complemented by co-finance of $16 million from the World Bank and $1.5 million from Australia. The Samoa Submarine Cable Company will provide $8.18 million in equity and the Government of Samoa will cover taxes and duties of $6.73 million. The total project cost is estimated at $57.4"""" million.

Currently Samoa is connected to the American Samoa-Hawaii cable system via the Samoa-American Samoa cable, which is operating at near capacity. The project will enable broader Internet access to meet Samoa's growing demand. The new system will link both Upolu and Savaii to Suva in Fiji.

The project aims to enhance low-cost broadband services to Samoa, strengthen the regulatory and legal environment for information and communication technology (ICT), and facilitate e-health investment in Samoa. Part of the project will involve implementing an e-health patient information system to improve patient care.

The outer island of Savaii will be connected to the existing cable for the first time enabling it to receive high-speed internet. It is expected the project will open up new economic opportunities, both domestically and regionally, and boost the delivery of public and social services.

For more information, visit www.adb.org.

Submarine Cable World™

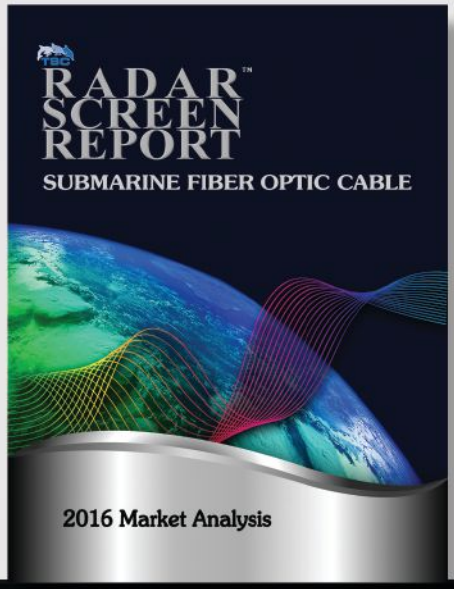
Daily Newsfeed • Industry Analysis • Consulting Services

The highly specialized 2016 Radar Screen Report is available this year in three volumes

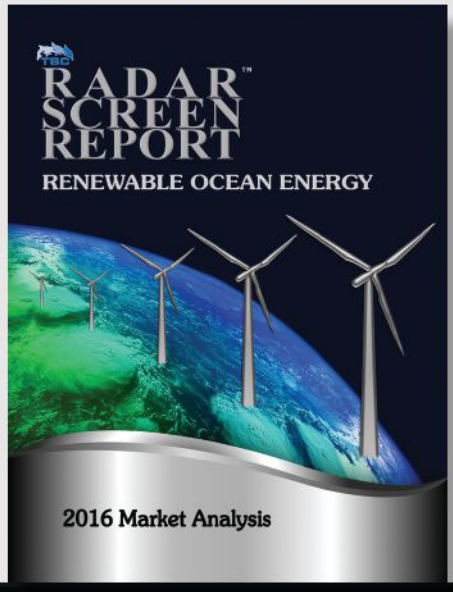
- Review of 2015 Contracts
- Forecast Demand 2016-2021
- Major Factors Impacting the Market
- List of 2015 Projects Under Contract
- List of Future Planned Projects

SUBMARINE POWER CABLE

SUBMARINE FIBER OPTIC CABLE



RENEWABLE OCEAN ENERGY



Order Today!

The 2016 Radar Screen Report™ is available in January and includes a mid-year update.
Place your order at www.subcableworld.com

Subscribe to the Submarine Cable World Daily NewsFeed™

Delivered electronically every weekday, the Submarine Cable NewsFeed™ includes the latest developments in:

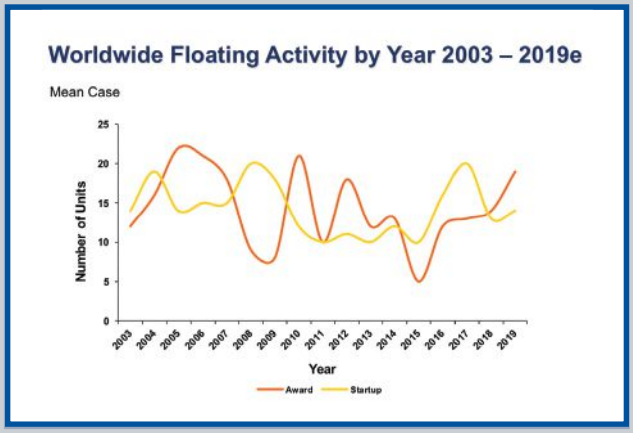
- Submarine Fiber Optic Communications
- Power Cables
- Renewable Ocean Energy
- Marine Cable Installation & Maintenance Services
- Regulation of Cables
- International Telecom Carrier Activities
- International Internet Markets

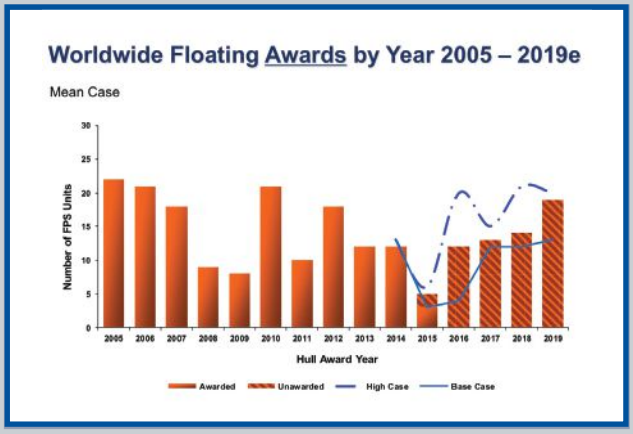
Subscribe at www.subcableworld.com

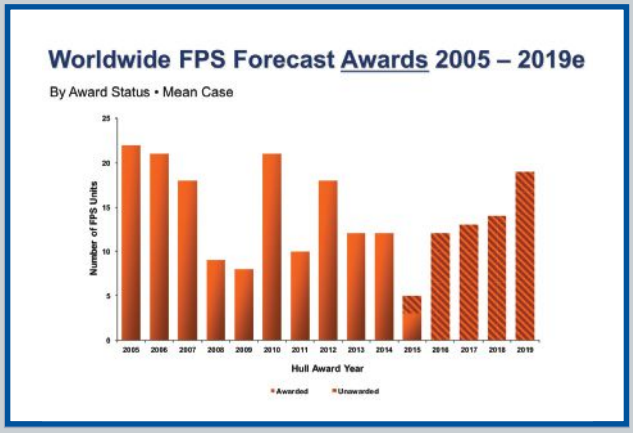
TSC **Published and distributed by TSC • www.subcableworld.com • 772-617-6787**

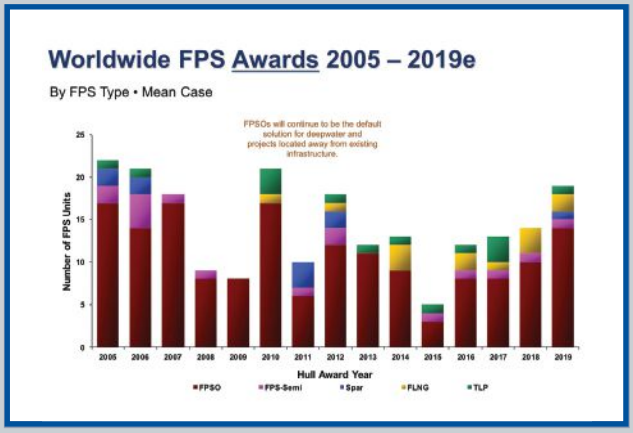
OFFSHORE STATS & DATA

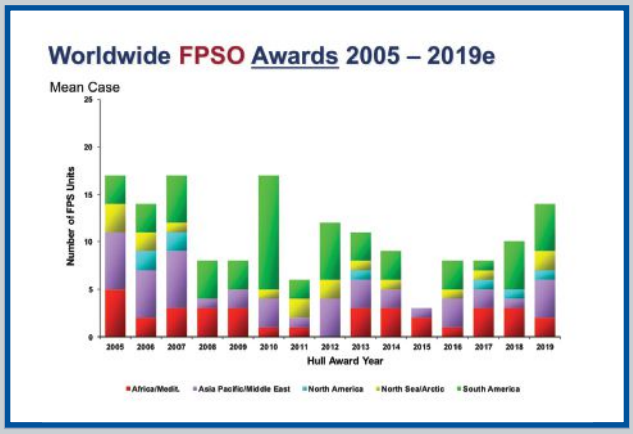
Quest Offshore Activity Report

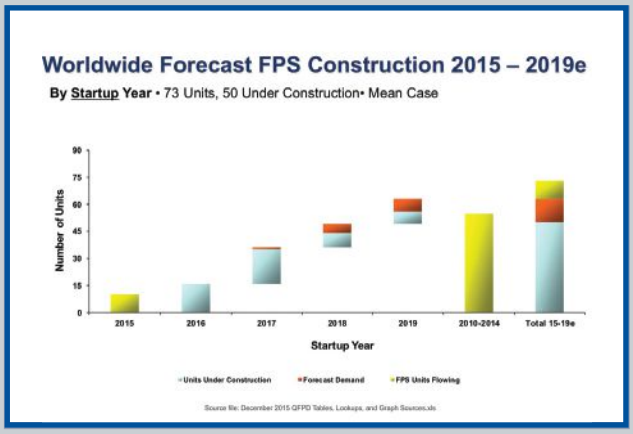












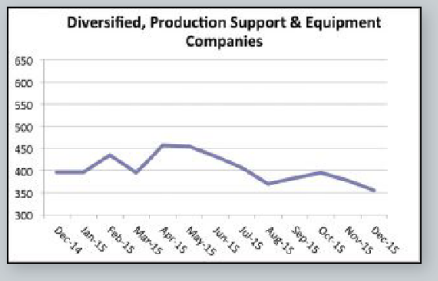
FOR MORE DETAILED INFORMATION
(281) 491-5900 - USA • 44 (0) 1737 371704 - London • e mail: corp@questoffshore.com
www.QuestOffshore.com • www.SubseaZone.com • www.FloatingProductionZone.com

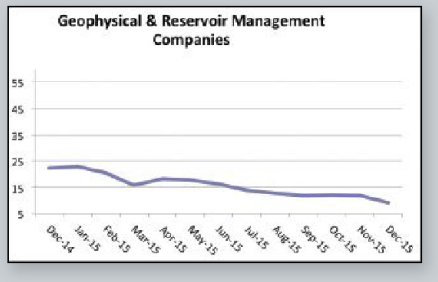
Monthly Stock Figures & Composite Index

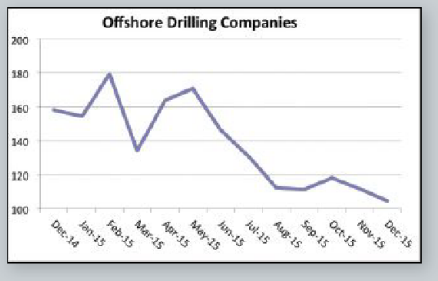
Industry Company Name	Symbol	Close(*Mid*) *December*	Close(*Mid*) *November*	Change	Change %	High 52 week	Low
Diversified, Production Support and Equipment Companies							
Baker Hughes, Inc.	BHI	45.05	48.86	-3.81	-7.8%	70.45	43.00
Cameron Intl. Corp.	CAM	63.68	66.88	-3.20	-4.8%	71.22	39.52
Drill-Quip, Inc.	DRQ	58.65	59.26	-0.61	-1.0%	81.78	53.37
Halliburton Company	HAL	35.19	37.47	-2.28	-6.1%	50.20	30.93
Tenaris SA	TS	23.42	24.84	-1.42	-5.7%	32.77	22.85
Newpark Resources, Inc.	NR	5.42	5.67	-0.25	-4.4%	10.85	4.77
Schlumberger Ltd.	SLB	70.57	76.29	-5.72	-7.5%	95.13	66.57
Superior Energy Services, Inc.	SPN	13.60	14.95	-1.35	-9.0%	26.95	12.35
Weatherford International, Inc.	WFT	9.05	10.16	-1.11	-10.9%	14.91	7.21
Deep Down, Inc.	DPDW	0.42	0.43	-0.01	-2.3%	0.94	0.37
FMC Technologies	FTI	29.84	32.31	-2.47	-7.6%	48.75	27.94
Total Diversified, Production, Support and Equipment.....		**354.89**	**377.12**	**-22.23**	**-5.9%**	**503.95**	**308.88**
Geophysical / Reservoir Management							
Dawson Geophysical Company	DWSN	3.33	3.95	-0.62	-15.7%	7.31	2.93
Mitcham Industries, Inc.	MIND	3.00	4.35	-1.35	-31.0%	7,92	3.00
Compagnie Gnrale de Gophysique-Veritas	CGV	2.78	3.55	-0.77	-21.7%	7.98	2.69
Total Geophysical / Reservoir Management..…….....		**9.11**	**11.85**	**-2.74**	**-23.1%**	**15.29**	**8.62**
Offshore Drilling Companies							
Atwood Oceanics, Inc.	ATW	12.38	15.30	-2.92	-19.1%	35.66	11.95
Diamond Offshore Drilling, Inc.	DO	21.60	21.20	0.40	1.9%	40.00	16.51
ENSCO International, Inc.	ESV	15.67	17.33	-1.66	-9.6%	33.24	13.26
Nabors Industries, Inc.	NBR	8.84	9.15	-0.31	-3.4%	16.99	8.37
Noble Drilling Corp.	NE	12.31	12.60	-0.29	-2.3%	19.61	10.34
Parker Drilling Company	PKD	1.97	2.67	-0.70	-26.2%	4.55	1.86
Rowan Companies, Inc.	RDC	18.74	19.51	-0.77	-3.9%	25.13	14.63
Transocean Offshore, Inc.	RIG	13.05	14.04	-0.99	-7.1%	21.90	11.26
Total Offshore Drilling..…….....		**104.56**	**111.80**	**-7.24**	**-6.5%**	**197.08**	**88.18**
Offshore Contractors, Services, and Support Companies							
Helix Energy Solutions Group, Inc.	HLX	5.09	5.8	-0.71	-12.2%	22.61	5.05
Gulf Island Fabrication	GIFI	9.34	10.05	-0.71	-7.1%	20.47	8.56
McDermott International, Inc.	MDR	3.35	5.65	-2.30	-40.7%	6.00	2.10
Oceaneering International	OII	37.8	43.34	-5.54	-12.8%	60.52	36.90
Subsea 7 SA	SUBCY.PK	7.11	7.63	-0.52	-6.8%	12.15	7.05
Technip ADS	TKPPY.PK	12.61	12.71	-0.10	-0.8%	18.15	11.30
Tetra Technologies, Inc.	TTI	8.10	8.62	-0.52	-6.0%	9.44	4.62
Total Offshore Contractors, Service, and Support..…….....		**83.40**	**93.80**	**-10.40**	**-11.1%**	**149.34**	**75.58**
Offshore Transportation and Boat Companies							
Seacor Holdings, Inc.	CKH	53.08	53.03	0.05	0.1%	78.95	51.16
Gulfmark Offshore, Inc.	GLF	5.08	5.05	0.03	0.6%	24.95	4.40
Bristow Group	BRS	24.65	29.14	-4.49	-15.4%	66.80	24.42
PHI, Inc.	PHII	18.66	20.54	-1.88	-9.2%	40.10	15.58
Tidewater, Inc.	TDW	6.50	10.28	-3.78	-36.8%	33.91	6.44
Trico Marine Services, Inc.	TRMAQ.PK	10.96	11.07	-0.11	-1.0%	14.35	10.22
Hornbeck Offshore	HOS	9.03	12.55	-3.52	-28.0%	25.77	9.01
Total Offshore Transportation and Boat ……..…….....		**127.96**	**141.66**	**-13.70**	**-9.7%**	**284.83**	**121.23**

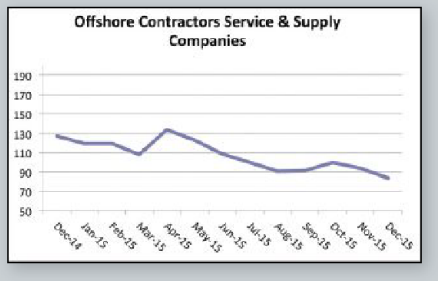
Monthly Stock Figures & Composite Index

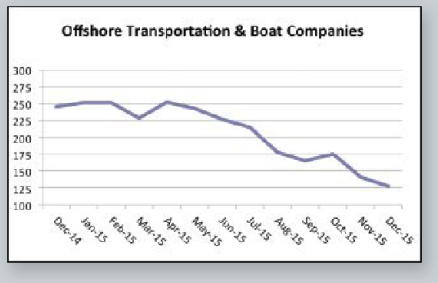
Industry	Close(*Mid*) *December*	Close(*Mid*) *November*	Change	Change %	High 52 week	Low 52 week
Total Diversified, Production, Support and Equipment	354.89	377.12	-22.23	-5.9%	503.95	308.88
Total Geophysical / Reservoir Management	9.11	11.85	-2.74	-23.1%	15.29	8.62
Total Offshore Drilling	104.56	111.80	-7.24	-6.5%	197.08	88.18
Total Offshore Contractors, Service and Support	83.40	93.80	-10.40	-11.1%	149.34	75.58
Total Offshore Transportation and Boat	127.96	141.66	-13.70	-9.7%	284.83	121.23
Total Offshore Source Index	679.92	736.23	-56.31	-7.6%	1,150.49	602.49

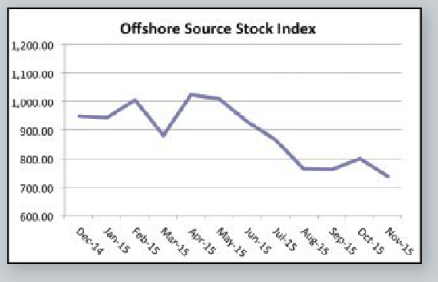










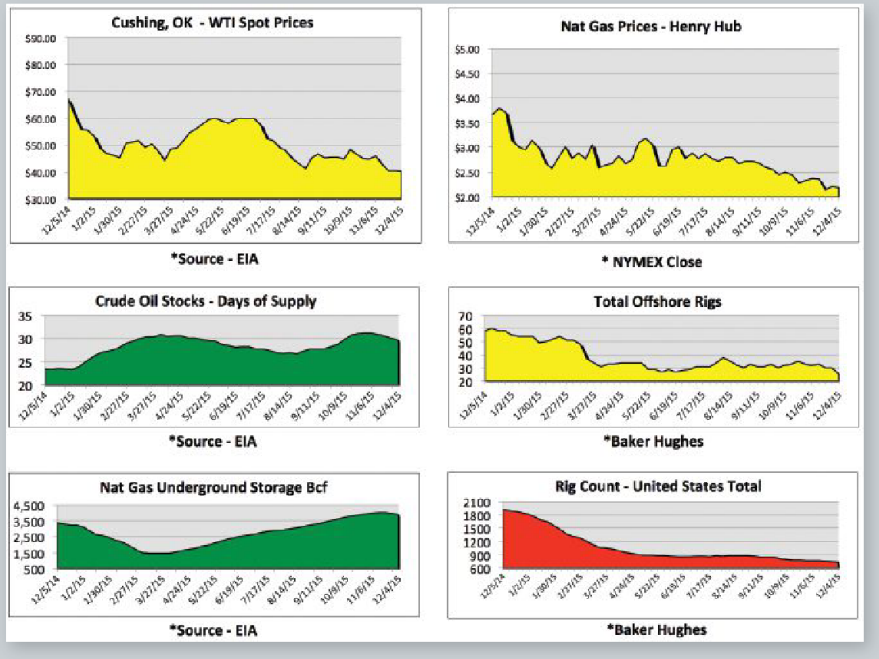


DISCLAIMER

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

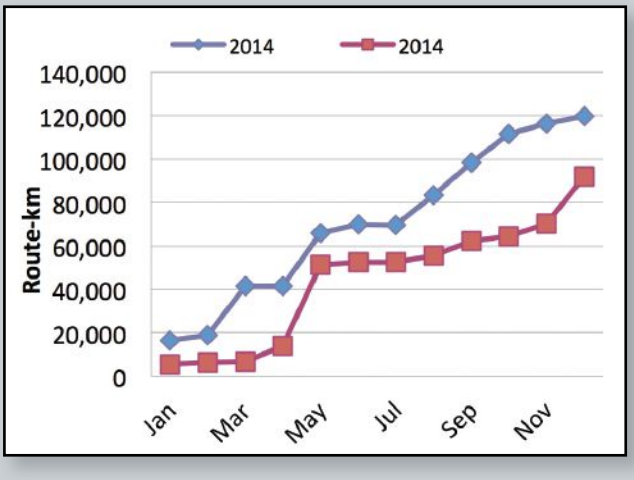
Monitoring the Pulse of the U.S. Offshore Oil & Gas Industry



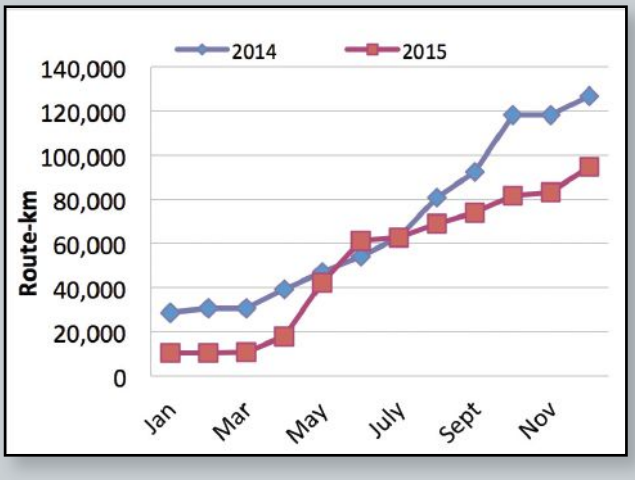
Positive trend, at least 3 weeks
Changing trend, less than 3 weeks
Negative trend, at least 3 weeks

Subsea Telecom & Power Cable Data

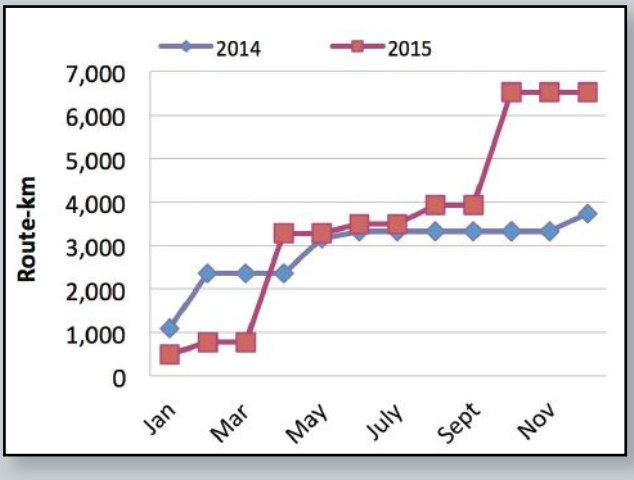
FO Cable Awards by Month



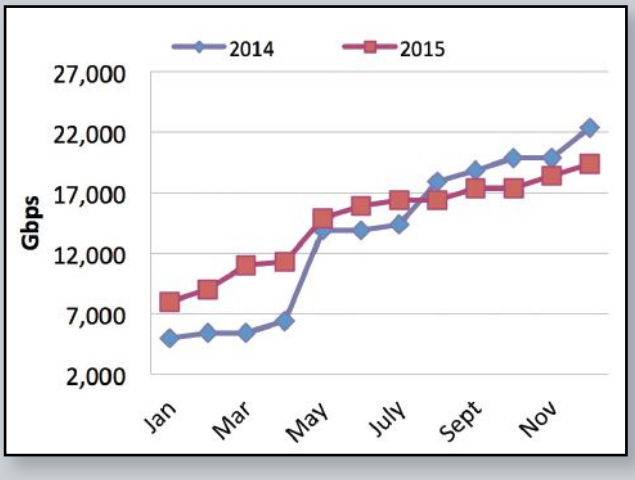
FO Cable Announcements



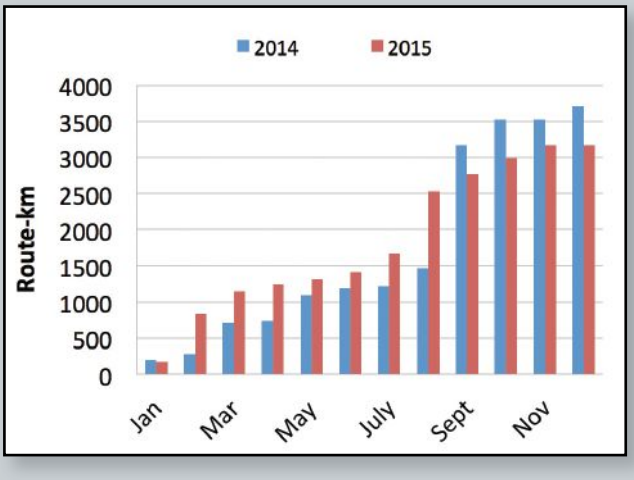
Submarine FO Cables Entering Service in Route-km



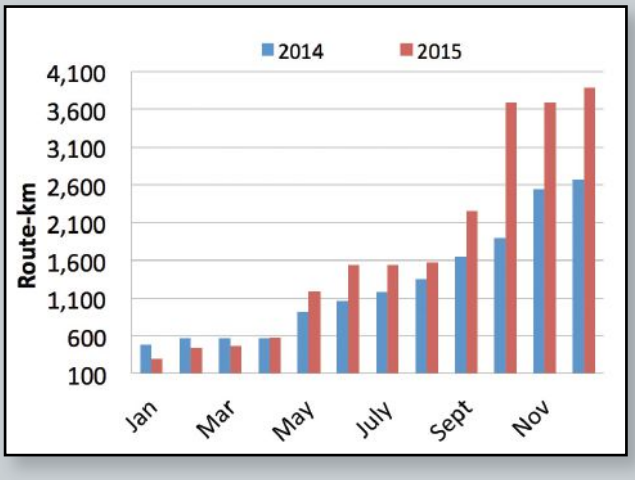
Upgrades of Existing Cable Systems in Gbps



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)
Shell Offshore Inc.	WR	508	G17001	NOBLE JIM DAY	Stones	9,568
Shell Offshore Inc.	AC	857	G20870	NOBLE DON TAYLOR	Great White	8,037
Shell Offshore Inc.	MV	657	G08496	T.O. DEEPWATER NAUTILUS	Coulomb	7,570
ExxonMobil Corp.	WR	584	G20351	MAERSK VIKING	Julia	7,120
Shell Offshore Inc.	MC	566	G08831	NOBLE GLOBETROTTER	Fourier addition	7,020
Chevron USA Inc.	WR	758	G17015	T.O. DISCOVERER CLEAR LEADER	Jack	6,968
BP Exploration & Production, Inc.	GC	743	G15607	SEADRILL WEST AURIGA	Atlantis	6,826
BP Exploration & Production Inc.	GC	743	G15607	T.O. DEVELOPMENT DRILLER II	Atlantis	6,814
Union Oil Co. of California	WR	634	G18745	PACIFIC SHARAV	Saint Malo	6,803
Repsol E&P USA Inc.	KC	686	G33341	ROWAN RENAISSANCE		6,162
BP Exploration & Production Inc.	MC	778	G14657	THUNDER HORSE PDQ	Thunder Horse North	6,031
Statoil Gulf of Mexico LLC	WR	160	G34634	T.O. DISCOVERER AMERICAS		5,861
Anadarko Petroleum Corp.	WR	51	G31938	DIAMOND OCEAN BLACKHAWK	Shenandoah	5,857
LLOG Exploration Offshore, L.L.C.	MC	300	G24064	SEADRILL WEST NEPTUNE	Delta House	5,746
BP Exploration & Production Inc.	MC	777	G09867	SEADRILL WEST VELA	Thunder Horse South	5,719
Eni U.S. Operating Co. Inc.	MC	772	G16647	ENSCO 8500	Triton	5,639
Freeport-McMoRan Oil & Gas LLC	MC	84	G08484	ROWAN RELENTLESS	King west	5,404
Freeport-McMoRan Oil & Gas LLC	MC	129	G10977	NOBLE TOM MADDEN	King South	5,330
ConocoPhillips Company	AC	475	G35137	MAERSK VALIANT		5,143
Cobalt International Energy, LP	GB	958	G30876	ROWAN RELIANCE		4,846
ExxonMobil Corp.	EB	945	G08211	T.O. DEEPWATER CHAMPION	Diana	4,639
ExxonMobil Corp.	EB	945	G08211	COIL TUBING UNIT (L.J. #3)	Diana	4,639
Anadarko Petroleum Corp.	GC	683	G18421	DIAMOND OCEAN BLACKHORNET	Caesar-Tonga	4,473
BP Exploration & Production Inc.	GC	782	G15609	MAD DOG SPAR RIG	Mad Dog Phase 2	4,428
Hess Corp.	MC	725	G22898	STENA FORTH	Tubular Bells	4,311
BP Exploration & Production Inc.	GC	627	G25174	SEADRILL WEST CAPRICORN		4,305
Chevron USA Inc.	GC	640	G20082	TRANSOCEAN DEEPWATER ASGA	Tahiti 2	4,292
BHP Billiton Petroleum (GOM) Inc.	GC	609	G16764	T.O. DEEPWATER INVICTUS	Shenzi	4,288
LLOG Exploration Offshore, L.L.C.	VK	959	G27247	SEADRILL SEVAN LOUISIANA	Imtegral	4,255
Statoil USA E&P Inc.	MC	942	G24130	MAERSK DEVELOPER	Mirage	4,197
Chevron USA Inc.	GC	596	G16759	T.O. DISCOVERER INSPIRATION	Tahiti North	4,023
Anadarko Petroleum Corporation	EB	646	G22295	NOBLE BOB DOUGLAS	Eriksson	3,901
Anadarko Petroleum Corporation	EB	646	G22295	* WIRELINE UNIT (L.J.DIST)	Eriksson	3,901
Freeport-McMoRan Oil & Gas LLC	GC	643	G35001	NOBLE SAM CROFT		3,885
Chevron USA Inc.	GB	978	G26693	T.O. DISCOVERER INDIA		3,836
Hess Corporation	GC	512	G26315	DIAMOND OCEAN BLACKLION	Stampede	3,577
Murphy Exploration & Production Company	GC	338	G21790	* WIRELINE UNIT (HOUMA #4)	Front runner	3,325
Shell Offshore, Inc.	MC	762	G24112	ATWOOD CONDOR	Deimos	3,144
Shell Offshore, Inc.	MC	807	G07963	OLYMPUS N88	Mars	2,945
Anadarko Petroleum Corporation	MC	711	G14016	CAL-DIVE Q-4000	Gomez	2,972
Shell Offshore, Inc.	MC	807	G07963	H&P 201	Mars	3,037
Energy Resource Technology GOM, Inc.	GC	237	G34971	CAL-DIVE Q-4000	Phoenix	2,249
LLOG Exploration Offshore, LLC	MC	794	G34909	NOBLE AMOS RUNNER		1,472
Hess Corp.	GB	216	G14224	NOBLE PAUL ROMANO	Penn state	1,450
Stone Energy Corporation	VK	989	G07923	H&P 100	Pompano i	1,290
Stone Energy Corporation	MC	26	G31474	ENSCO 8503	AMETHYST	1,113
EnVen Energy Ventures, LLC	MC	194	G02638	NABORS S.D. XIV	Cognac	1,024
Fieldwood SD Offshore LLC	EB	160	G02648	* WIRELINE UNIT (L.J.DIST)	Cerveza	940
Whistler Energy, LLC	GC	18	G04940	NABORS MODS 201	Boxer	750
Chevron USA Inc.	GB	189	G06358	WIRELINE UNIT (L.C. DIST)	Tick	718
W&T Offshore, Inc.	EW	910	G13081	H&P 203		557

Deepwater prospects with drilling and workover activity: 55

Current Deepwater Activity as of Monday, December 14, 2015

Activity by Water Depth

Water Depth (m)	Active Leases	Approved Applications	Active
0 to 200	1,257	36,278	2,250
201 to 400	84	1,128	20
401 to 800	186	900	10
801 to 1,000	270	579	9
1,000 & above	2,709	2,099	28

Rig Activity Report 11 Devember 2015

Location	Week of 09/11	+/-	Week Ago	+/-	Year Ago
Land	684	-26	710	-1136	1820
Inland Waters	2	0	2	-11	13
Offshore	23	-2	25	-37	60
U.S. Total	709	-28	737	-1184	1893
Gulf of Mexico	23	-2	25	-35	58
Canada	174	-3	177	-257	431
N. America	883	-31	914	-1441	2324

Activity by Water Depth Information current as of Monday, December 14, 2015.
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 and Baker Hughes

Amron Intl. introduces new and improved DSP3 communicators

For decades, deep commercial diving operators have had to overcome the challenge of unscrambling very high-pitched speech inherent with divers breathing in a helium mixed air and gas environment. As a leading manufacturer of diving communicators for over 35 years, Amron has supported these dive operators by manufacturing state-of-the-art helium speech unscramblers. Amron is pleased to introduce our third generation Digital Signal Processing (DSP3) Helium Speech Unscrambler (HSU), integrating the latest in technological advancements in an innovative design that corrects the diver's raw helium speech into normal intelligible voice levels and reduces the amount of detectable background noise without affecting the diver's speech.

Diver communication is available in either 2-wire or 4-wire mode or any combination of the two modes. Separate channels and volume controls are also included for each diver and the tender and an improved Treble Boost Control feature allows for optimum frequency enhancement and improved intelligible speech from the commercial diver's microphone. The new multi-turn depth control allows the tender to finely adjust the amount of correction used to provide the best speech quality possible.

"Amron's innovative design allows our HSU to be truly the first unscrambler to use both frequency and time domain technologies for real-time audio processing," said Scott Ritchie, vice-president of engineering and Manufacturing at Amron International. "This state-of-the-art digital design accommodates a multitude of functions ranging from the correction of the diver's raw helium speech to normal intelligible voice levels, advanced treble boost, and complex noise reduction filters (NRF)."

Both the Portable and Rack Mount versions of the Amron Amcom™ II and Amcom™ III Diver Communicators with DSP3 Helium Speech Unscramblers are currently available for purchase on the Amron International website at www.amronintl.com.

LinkQuest enters multibeam echosounder market

LinkQuest Inc., a leading manufacturer of precision acoustic instruments in the world, recently added a state-of-the-art multibeam echosounder product into its extensive product family of highly sophisticated acoustic instruments.

The EchoSweep 300 multibeam echosounder is a high-resolution, highly robust and cost-effective swath bathymetric system for mapping of seafloor, inland waterways and reservoirs. The EchoSweep 300 system is capable of reaching up to 280 m in range with 140 beams. It operates at 260 KHz and has a swath coverage of 140°.

The EchoSweep 300 multibeam echosounder maps the seafloor accurately by a sweep of very narrow acoustic beams. It can map the seafloor faster and in more detail than a single-beam echosounder, thereby significantly reducing the user's survey time and cost.

The EchoSweep 300 system is a useful tool for hydrographic and bathymetric surveys, underwater inspections, dredging, pipe line inspection, cable-laying, and many other underwater applications.

For more information, please visit www.link-quest.com.

Maxon Motor introduces compact underwater DC drives

Maxon Motor has worked closely with research institutes and universities to provide solutions that meet the many demanding challenges for electrical and mechanical components required for underwater systems.

Electrical actuated underwater vehicles like ROVs and AUVs require drives that are light weight, highly efficient and compact in design. Maxon's program of aquatic solutions offer these features and much more.

The thrusters and actuators are oil filled and range in size from 16 to 42 mm in diameter. The core element is a motor-gear combination based on a brushless DC-motor and a planetary gearhead. These underwater drives are designed with a high-quality polymer housing to ensure protection against the harsh underwater elements.

Maxon's MT-30 thruster is pressure tolerant up to 6,000 m with oil compensation. The propeller is modified for low noise operation. Other features include output power of 180W, voltage of 48, and a weight slightly under 2 lbs.

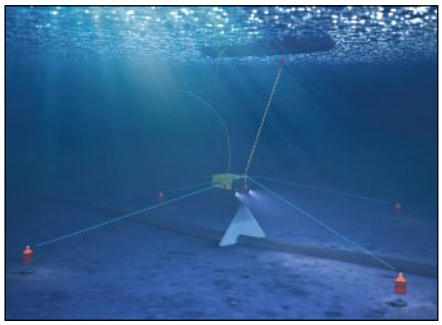
For more information, visit www.maxonmotor.com.

New third generation HiPAP system takes acoustic positioning to the next level

The third generation of Kongsberg Maritime's de facto industry standard High Precision Acoustic Positioning and Navigation System–HiPAP is now available. Smaller, lighter, more durable and accurate than ever, HiPAP 502 sets new standards for subsea position reference systems. It is designed to support the performance and safety of offshore support, survey, subsea construction and scientific vessel operations.

HiPAP 502 is the latest in a long line of High Precision Acoustic Positioning Systems from Kongsberg Maritime. Simrad, a Kongsberg Maritime brand, introduced the first HiPAP 500 in 1996 and the Second generation (HiPAP 501) was released as a Kongsberg Maritime product in 2007. Now in 2015 the third generation is released with major advances.

The new HiPAP 502 specifications deliver 100% better angle accuracy, with improved range capability to 5,000 m. Angle accuracy is essential in SSBL (or USBL) positioning; the HiPAP 502 has an accuracy of 0.06° vs the 0.12° of the HiPAP 501.



The third generation HiPAP features a smaller and lighter transceiver unit, which is housed in a stainless steel cabinet and is less temperature sensitive so there is no requirement for extra cooling in warm environments. It also uses new Low Power Transceiver (LPT) boards with better filtering and signal processing, providing an extra 5 to 6 dB more sensitivity. Due to improved sensitivity, the source level from the transponder can be less, which also increases battery endurance.

With the additional capability of sending and receiving high speed acoustic telemetry data, Kongsberg Maritime expects HiPAP 502 to be well received by existing and new users for a diverse range of applications.

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

Miniature circular connectors withstand harsh environments

TE Connectivity (TE), a world leader in connectivity, announces the launch of its DEUTSCH AFD Series connectors that feature bayonet coupling and rear release contacts in a miniature circular connector system with sealing. These connectors are specifically designed to withstand harsh environments, are frequently used in aerospace applications and military ground vehicles, and are MIL-DTL-26482 Series II-qualified.

The DEUTSCH AFD Series connectors are built to perform well in harsh environments. The connectors are triple-wire sealed for sealing over a wide range of wire diameters and also have raised moisture barriers around each pin for individual contact sealing. The bayonet coupling allows easy installation and a closed entry socket insert provides positive pin alignment. The connectors are available in four receptacle mounting styles: square flange, wide square flange, cable connecting and single hole mount. Plugs are available with and without EMI fingers. The miniature circular connectors have a shell made of aluminum alloy, and shell plating comes in nickel, black anodized or olive drab cadmium over a nickel base.

For more information, visit www.deutsch.net.

CARIS Onboard 1.0 released

CARIS is pleased to announce its release of the highly anticipated, near real-time data processing and mapping application, CARIS Onboard™. The development of this new technology will revolutionize the way in which bathymetry and imagery data is processed.

CARIS Onboard automatically converts data as it becomes available and applies a range of pre-determined corrections, the data can then be used to generate a terrain model or mosaic. This allows for early visualization of seafloor characteristics, putting a greater emphasis on quality control and supporting an environment of improved decision making and greater efficiency. CARIS Onboard has been designed to work with survey launches, autonomous underwater vehicles and unmanned surface vehicles. CARIS Onboard is a force multiplier allowing multiple datasets to be processed quickly and consistently. With the ever-expanding volume of data being collected at higher resolutions, CARIS Onboard fits seamlessly into the Ping-to-Chart™ suite of software and reduces your product creation timeline.

The creation of CARIS Onboard is the next step in the ever-evolving hydrographic data processing landscape and is based on decades of trusted expertise. CARIS Onboard is supported by the highly scalable CSAR framework and designed to function in both high and low bandwidth environments, including remote operations. This software will provide an operational advantage by enabling your skilled workforce to concentrate on getting the best results possible.

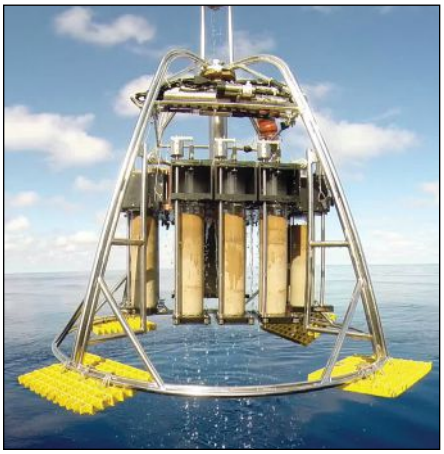
For more information, visit www.caris.com.

OSIL releases coring camera

UK-based bespoke marine engineering company Ocean Scientific International Ltd (OSIL) has announced the release of an innovative new camera system designed to be mounted to deep sea sediment corers.

The self-contained system will allow users to record the corer deployment and review the footage on recovery of the corer to check that the system has deployed correctly, aid analysis of the sample and re-deployment of the corer, and offer a laser ranged view of the sediment itself via a graticule scale.

The camera is attached to the corer and can be programmed at the surface to turn on and begin recording at a specific depth (i.e., deployment depth or just before) via a pressure switch, and records until retrieved to the same depth, which



means users do not have to review hours of wasted footage. Data is recorded onto a standard SD memory card.

The system is equipped with an internal power pack that enables recording on repeated deployments to obtain up to an hour of footage. Recharging and data transfer takes place via an external charging port. The camera is equipped with variable powered lights that can either be fixed to the side of the camera or positioned elsewhere via umbilicals to allow adjustments to be made for visibility. The standard housing is rated to 6,000 m, but systems for shallower use are also available.

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

Teledyne TSS' Saturn fibre optic gyrocompass achieves Wheel Mark status

Teledyne Marine announced that after comprehensive testing, the full range of Teledyne TSS Saturn Fibre Optic Gyrocompasses has achieved Wheel Mark type approval under the MED (Marine Equipment Directive) Module B for meeting the performance standards required by gyrocompasses used for commercial shipping. The equipment is now fully approved for Gyro-Compass Equipment (Annex A.1/4.3), Gyro-Compass for High Speed Craft (Annex A.1/4.31) when operating at vessel speeds above 30 kts, as well as Rate of Turn Indicator (Annex A.1/4.9).

MED ensures a uniform implementation of international instruments for compliance with international conventions in order to ensure maximum degree of reliability and safety at sea, to prevent maritime casualties and pollution, and to ensure free movement of equipment within the European Union.

The equipment is also approved under the U.S. – EC Mutual Recognition Agreement. (US Coast Guard Module B Number 165.103/EC0168 and 165.203/EC0168 also apply.)

The Saturn fiber optic gyrocompass unit is built upon more than 100 years' experience in marine navigation. This experience and industrial innovation has enabled the TSS engineering team to integrate the latest solid state technologies to offer a user-friendly, highly accurate and cost-effective gyrocompass solution for demanding marine environments. Ideal as any type of navigation device, the Saturn products have impeccable specifications and significant qualities ensuring suitability for

many navigation applications. Having already tested the market with its full launch in 2014, the Saturn products are now fully ready to become a major player in the commercial shipping market. Designed to fulfil the primary navigation need, the device is a strap-down attitude and heading reference system (AHRS), producing a maintenance-free unit. A lightweight, compact and highly reliable gyrocompass, the Saturn provides flexibility in use and integration with a complete suite of Teledyne TSS repeaters and ancillaries ensures that Saturn is suitable for any size of vessel.

For more information, visit www.teledyne-tss.co.uk.

2G Robotics delivers two deep-rated Laser systems to Oceaneering

2G Robotics recently delivered two deep-rated ULS-500 subsea laser systems to Oceaneering International, Inc.'s business unit, Oceaneering Survey Services. Including these two ULS-500 systems, Oceaneering now utilizes six of the ULS-500 systems with its AUVs as part of its advanced survey and inspection services for assessing pipeline and flowline integrity. Oceaneering has used the 2G Robotics ULS-500 system to accurately and efficiently inspect 2,500 km of pipeline and flowline.

The ULS-500 can be used to perform high-quality stationary scans, but the system delivers even greater operational value when integrated with subsea vehicles to perform dynamic scanning. The ULS-500 is specifically designed for dynamic scanning with development focused on subsea vehicle integration, high sample rates, and timing synchronization for efficient and accurate data acquisition.

Dynamic scanning with the ULS-500 notably increases operational efficiency compared to traditional sonar and acoustic techniques as the high sample rates of the system allow for faster vehicle traversal for faster inspections. With dynamic scanning, one of the critical features is precision time synchronization since inaccuracies with time synchronization will produce inaccuracies with model generation. The ULS-500 uses PPS (pulse per second) time synchronization as it provides better timing accuracy than a standard NTP (network time protocol) time synchronization approach, ensuring better data accuracy.

For more information, visit www.2grobotics.com.

A DVL that fits in the palm of your hand

The trend in the underwater vehicle community is for smaller size and greater flexibility. Nortek has, therefore, designed a DVL with workclass capability that fits in the palm of your hand–while offering higher precision navigation. With the introduction of the Nortek DVL, navigation capabilities of smaller underwater vehicles is no longer limited by the size and cost of the DVL. Our recently developed DVL opens the door to new possibilities.

The Nortek DVL is tailor-made for operational users of workclass and mini ROVs and AUVs alike. It contains all the functionality of a classic DVL but has now taken advantage of the possibilities offered by a modern hardware platform. The package size is small yet does not compromise performance.

A casual review of the DVL shows that Nortek has managed to reduce size and power consumption as well as incorporate modern communication channels. However, it is the powerful processing of the new platform that helps users improve on the capability of the bottom tracking.

You can expect bottom lock for greater ranges, soft bottoms, and very close to the bottom. In addition to the robust bottom track, the data stream contains information such as data quality parameters and time stamps with a 1-millisecond resolution. Precise knowledge of when the velocity estimate were made provides more accurate navigation.

For more information, visit www.nortek.no.

Don't Miss being Seen in the 2016 Product & Service Directory

Who Manufactures?

Who Sells?

Who Rents?

Who Provides the Service?

From A-Frames to Winches; Cable Installation to Welding & Fabrication
Available in spring of 2016, Ocean News & Technology's Product & Service Directory will list more than 300 products and services, distinguishing manufacturers, sellers, rental agents and service providers.

5 Minutes can make all the difference - Free Listings
List your company in the directory that will be used most often. Take time now to complete our listing form at www.oceannews.com/product-service-directory.

About the Directory: Published in digital format and distributed to more than 13,000 industry professionals early next year, ON&T's Product & Service Directory will be available online 24/7, and redistributed to the industry mid-year.

visit www.oceannews.com/product-service-directory

For advertising information, contact:

North America
Lisa Chilik
574-261-4215
lchilik@tscpublishing.com

International
Mimi Shipman
+44(0)777 601 7564
mshipman@tscpublishing.com

Corporate
Jessie Lewis
772-617-6787
jlewis@tscpublishing.com

The Society of Petroleum Engineers (SPE) Aberdeen Section Board has elected **Ian Phillips**, chief executive of the Oil and Gas Innovation Centre (OGIC), as its new chairman. Mr. Phillips assumes the position from Shankar Bhukya, who has stepped down ahead of a move to Singapore. Mr Phillips, an MBA qualified Chartered Petroleum Engineer with more than 30 years' experience in the oil and gas industry, has played an instrumental part in the growth of the SPE Aberdeen Section over the last 30 years.

Phillips

The Bureau of Ocean Energy Management (BOEM) director Abigail Ross Hopper announced **Mike Celata** as the regional director of the Gulf of Mexico Outer Continental Shelf (OCS) Region. Celata, who starts his position immediately, has been with BOEM and its predecessors since 1988. He served as Acting regional director prior to his selection. The Gulf of Mexico Region is responsible for managing more than 4,600 active leases over 25 million acres of land on the OCS.

Celata

Subsea technology company, Sonardyne International Ltd., UK has announced the appointment of **Robin Bjorøy** as its new managing director. He succeeds John Ramsden who leaves the position after 6 years in charge to return to Singapore following a transition period. **Bjorøy** joins Sonardyne with immediate effect and brings with him extensive operational and management experience gained over a 27-year international career with GecoPrakla, WesternGeco and Schlumberger. Robin has served in seismic field surveys, product development, survey design and management roles internationally, including Middle East, Africa and Asia as well as in the UK.

Bjorøy

Bollinger Shipyards announces the addition of **Joe Mayhall** to its corporate sales and marketing team. He brings to the table 23 years as a solid contributor in shipyard sales and marketing. Mayhall is a veteran of new construction and ship repair sales and has worked in increasingly responsible positions, overseeing blue water ship repair and new construction sales in the oilfield and passenger vessel markets as well as coordinating advertising and marketing.

Veripos, the leading supplier of high-precision GNSS positioning services to the world offshore and associated industries, has appointed **Miguel Amor** as global vice-president of marketing & product development. He joins the Aberdeen-based company from Trimble following a 12-year close association with marketing and business development of its RTX, OmniSTAR and VRSNow land-based correction facilities.

MacGregor, part of Cargotec, has created a new division, Advanced Offshore Solutions, by merging its two Norway-based divisions and combining the strengths in offshore mooring, loading and load handling businesses. With the new joint division MacGregor aims to gain synergies and improve the operations as well as customer service. **Høye G. Høyesen** has been appointed to lead the new Advanced Offshore Solutions division, which will become operative on 1 January 2016.

RDSEA International (St. Pete Beach, Florida, USA) and **Campbell Scientific; Centro Caribe** (San Jose,

Costa Rica) have been awarded a contract with APM Terminals (Netherlands) for a MetOcean and EIS study of harbor and port expansion in Limon, Costa Rica. Full surveys and a real-time data program displaying water column physics and water quality parameters will be conducted over a 3 year period beginning in early 2016.

NorSea Group (UK) Ltd has won a five-year contract with **Wild Well Control** for the storage of its emergency response WellCONTAINED System at NorSea Group's facilities in South Base, Montrose. The WellCONTAINED system of services includes contingency planning and response from source control emergency response planning through field deployment of the system capping a subsea uncontrolled well.

International oilfield services company **Expro** has achieved a significant milestone as it enters Qatar for the first time and expands its Middle Eastern presence with a 5-year contract win. The contract will see Expro provide its range of well intervention and slickline services, including high deviation and heavy-duty fishing offshore Qatar, as well as in drilling and workover locations in-country.

Ashtead Technology, the leading independent provider of subsea equipment rental, sales and services to the offshore industry, has invested over $300,000 in the latest generation of visual inspection tools for deep sea exploration. The investment will see Ashtead offering a range of SubC Imaging products to meet increasing industry demand for enhanced, cost-effective inspection solutions. A world-leader in video technology used to monitor the integrity of subsea assets and infrastructure, SubC Imaging provides state-of-the art cameras with HD video capabilities that can capture and transmit high quality data from extreme water depths.

Unique Group has acquired **GSE Rentals,** a rental specialist of high quality geophysical, hydrographic and oceanographic marine survey equipment. GSE Rentals is now wholly owned by Unique Group and the company's workforce will be retained. Former owner, Stan Moroney, will continue as business advisor and consultant to Unique Group.

Unique Group is making its first move into the Kingdom of Saudi Arabia with the opening of two new facilities in Riyadh and Dammam. With the opening of the two new sites, Unique Group is signalling its commitment to growth in the Kingdom as well as the wider Middle East. The move is being made in response to customer demand for products and support services to be provided locally. Ten skilled engineering roles will be created throughout 2016, some of which will be filled by local people and in line with the Kingdom's aspirations to increase opportunities for its indigenous workforce.

SeeByte, the global leader in creating smart software for unmanned maritime systems, is pleased to announce that they will be expanding their offices and taking space in the Marine Robotics Innovation Centre at the National Oceanography Centre (NOC) in Southampton.

TE Connectivity has expanded its marine cable capabilities in China. The new manufacturing facility in Kunshan, China is delivering TE's C-Lite cable family of marine classified cables, expanding the offering to their customers in Asia. The new location will reduce lead time, taking the average delivery time from 12 weeks down to just 5 weeks.

February 2-4, 2016
GoM Oill Spill & Ecosystem Science
Tampa, FL
www.gulfofmexicoconference.org

February 3-5, 2016
Subsea Expo
Aberdeen, Scotland
www.subseaexpo.com

February 9-10, 2016
Deep Sea Mining Summit
Aberdeen, Scotland
www.deepsea-mining-summit.com

February 23-25, 2016
Decommissioning and Abandonment
Houston, TX
www.decomworld.com/decommissioning

February 23-25, 2016
ICOE
Edinburgh, UK
www.icoe-conference.com

February 23-25, 2016
Underwater Intervention
New Orleans, LA
www.underwaterintervention.com

March 6-10, 2016
NACE Corrosion
Vancouver, BC
www.nacecorrosion.org

March 15-17, 2016
Oceanology International
London, UK
www.oceanologyinternational.com

March 16-18, 2016
Asia Pacific Maritime
Singapore
www.apmaritime.com

March 21-23, 2016
Maritime Security East
Norfolk, VA
www.maritimesecurityeast.com

March 22-24, 2016
Subsea Tieback
San Antonio, TX
www.subseatiebackforum.com

March 22-25, 2016
OTC Asia
Kuala Lumpur, Malaysia
www.otcasia.org

April 3-5, 2016
Canadian Underwater Conf & Expo
Halifax, Nova Scotia
www.underwaterconference.ca

April 5-7, 2016
MCE Deepwater Development
Pau, France
www.mcedd.com

April 11-13, 2016
SPE HSSE-SR
Stavanger, Norway
www.spe.org/events/hse/2016

April 18-21, 2016
ONR/MTS Buoy Workshop 2016
Woods Hole, MA
www.whoi.edu/buoyworkshop/2016

April 18-21, 2016
SubOptic
Dubai, UAE
www.suboptic2016.com

May 2-5, 2016
OTC
Houston, TX
www.otcnet.org

Registration is now live: Oceanology International 2016 well set for record-breaking success

With just over three months until it opens, Oceanology International 2016 (OI) being held at ExCeL London, Tuesday 15 – Thursday 17 March 2016, is well set to be a record-breaker. It has already matched the size of OI 2014 and, with hundreds of additional metres on reserve and due to be confirmed soon, the 2016 event will be the biggest OI of all time!.

"We are delighted that OI still boasts such great support and engagement from the global industry and immensely proud it is coming together en masse to make this the biggest event in OI's history," says Event Director, Jonathan Heastie of Reed Exhibitions. "Over 8,000m2 has already been sold to 326 exhibiting companies from 32 countries. It is always good news when returning exhibitors take more space and this has been the case with over a hundred exhibiting companies.

And, we are delighted to welcome 59 new exhibiting companies. No doubt when the names of companies sharing booked stands start to emerge we will find there are even more suppliers dipping their toes into the OI 'water' for the first time.

"We welcome Fugro, Teledyne, Keller and IXBlue as sponsors of key elements of next spring's show, which is held in partnership with The Society for Underwater Technology, and with the Hydrographic Society UK, IMarEST, IMCA, the Marine Technology Society, and the Society of Maritime Industries as endorsing organisations."

Looking towards the OI 2016 conference Jonathan Heastie adds: "Now, with under two weeks to go before the call for abstracts closes (16 October) we are looking forward to being able to announce an innovative program under our eleven topic headings: Unmanned Vehicles and Vessels Showcase; Ocean Observing Systems: Marine Technology and Services Sector Role in the Blue Economy; Positioning & Metrology; Handling Big Data; Marine Renewables; Hydrography, Geophysics and Geotechnics; Oil & Gas: What's next for ageing offshore assets?; Monitoring Structural Integrity: Understanding Risk and Reliability; Aquaculture; Green Shipping; and Near and Far Markets. I would urge anyone with case histories and news of innovative developments under any of these headings to complete our online abstract submission form with speed!" Full details on all aspects of the call for abstracts is online at www.oceanologyinternational.com/Whats-On/Conference.

There are Canadian, French, German, Irish, Dutch and US national group stands at OI 2016, as well as a diving pavilion; and individual exhibitors come from Australia, Belgium, Canada, China, Denmark, Estonia, Finland, France, Germany, Hong Kong, Iceland, Italy, Latvia, Malta, Netherlands, New Zealand, Nigeria, Norway, Portugal, Romania, Russia, Singapore, Slovakia, South Africa, South Korea, Spain, Sweden, Switzerland, Turkey, UAE, UK and the USA.

Vessels and dock-side demonstrations of equipment will once again be a popular feature. In 2014 vessel movements proved a record-breaker with 148 movements during the three days with 1,198 people aboard and a record number of 13 visiting vessels. Those eager to participate in this year's waterborne and demonstration areas are asked to contact vessel manager Stephen Taylor at Tel: +44 (0)17 3082 1661 or e-mail: dandstayl@aol.com at the earliest opportunity. As at all Oceanology International events, networking will play an important role.

Register for free for OI 2016 at www.oceanologyinternational.com or e-mail OITeam@reedexpo.co.uk for more information.

OCEAN NEWS & TECHNOLOGY

www.oceannews.com

JANUARY
Editorial: Underwater Navigation; Manned Submersibles
Distribution: Underwater Intervention; GOM Oil Spill & Ecosystem
Product & Services Focus: Multibeam & Side Scan Sonars; Research & Development Services

FEBRUARY
Editorial: Oceanology & Meteorology; Decom & Abandonment
Distribution: 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: Canadian Underwater Conf & Expo; SPE HSSE-SR; SubOptic
Product & Services Focus: Connectors; Cables & Umbilicals; Diver Detection Systems

APRIL
Editorial: Offshore Technology; Ocean Mapping & Survey
Distribution: OTC; AUVSI; Deepwater Decommissioning Workshop
Product & Services Focus: Subsea Tools & Manipulators; Batteries; Training/Safety

MAY
Editorial: UW Imaging & Processing; Marine Salvage/UW Archeology
Special Focus Section: *Executive Profiles*
Distribution: UDT (Norway) PORTS; Seawork International
Product & Services Focus: Magnetometers; Water Dredges & Airlifts; Diving Services

JUNE
Editorial: Autonomous Unmanned Vehicles; Defense & Naval Systems;
Special Focus Section: *New Product Profiles*
Distribution: Clean Pacific
Product & Services Focus: Tracking & Positioning Systems; Seismic Monitoring; Equipment Leasing/Rental Services

JULY
Editorial: Ocean Engineering; Marine Construction
Special Focus Section: *Company History Profiles - Then and Now*
Distribution: TBA
Product & Services Focus: Navigation, Mapping & Signal Processing; Data Processing Services

AUGUST
Editorial: Workclass ROVs; Deepwater Pipeline/Repair/Maintenance
Distribution: Offshore Northern Seas
Product & Services Focus: Cameras, Lights & Imaging Sonars; Oil Spill Clean-Up Services

SEPTEMBER
Editorial: Ocean Observing Systems; Subsea Telecom; Offshore Wind Installation & Maintenance
Distribution: AWEA Offshore Windpower; Oceans '16 MTS/IEEE Monterey; Teledyne Marine Technology Workshop
Product & Services Focus: Water Sampling Equipment; Cable Installation Services

OCTOBER
Editorial: Offshore Communications; Subsea Inspection, Monitoring, Repair and Maintenance
Distribution: OilComm; Offshore Energy; Clean Gulf; Offshore Asset Retirement Conference; Offshore Well intervention GoM
Product & Services Focus: Acoustic Modems, Releases & Transponders; Marine Communications; Survey & Exploration Services

NOVEMBER
Editorial: Offshore Support, Supply & Emergency Vessels; Deep Sea Mining
Distribution: International Workboat
Product & Services Focus: Ship Protection Systems; Cranes, Winches & Control Systems; Vessel Charter/Leasing Services

DECEMBER
Editorial: Light Workclass ROVs; Commercial Diving; Year in Review; UI Pre-show issue
Distribution: Offshore & Deep Sea Mining
Product & Services Focus: Diving Equipment & Services; Buoyancy Materials; Construction & Repair Services

Serving the Ocean and Offshore industry, Ocean News & Technology has a long, rich history as the primary information resource executives around the world rely on.

For more than 30 years ON&T has provided news, forecasts, and authoritative feature articles designed to keep industry leaders informed and focused on the future of the industry.

Industry's Choice creates Advertiser's Advantage

ONT's unique comprehensive format and cutting-edge distribution methods demonstrate the publication's standing as the #1 choice for industry news, making it the best ROI choice for advertisers!

Print – Still the preferred format in the industry, ON&T print copies are distributed worldwide.

Digital – No matter where they are in the world, subscribers also have the benefit of the digital edition, complete with linked websites in ads, articles and releases.

APP – ON&T's free APP is utilized thousands of times each month, creating an instant path from ads to websites 24/7.

VIDEO-IN-PRINT – Embed video in your ad! Viewed by digital and APP readers, your VIP can be informational, inspirational, and/or entertaining.

Ocean Industry Directory – Each issue features a directory providing your product, services and contact information to buyers around the world. Listings are available in print and digital editions and can be updated throughout the year.

Archives – Available through digital and APP, readers can research historical data, articles, and references with the aid of Keyword Search.

TSC

ADVERTISING

North America
Lisa Chilik
574-261-4215
Lchilik@tscpublishing.com

International
Mimi Shipman
+44 (0) 777 601 7564
mshipman@tscpublishing.com

Editorial
Ladd Borne
772-285-8308
lborne@tscpublishing.com

OCEAN NEWS & TECHNOLOGY

www.oceannews.com

OCEAN INDUSTRY *MONTHLY* DIRECTORY

CURENT LISTINGS IN EVERY ISSUE

Ocean Industry Directory is featured in every issue of Ocean News, and the industry knows this is the one source they can count on to provide them with up to date listing information for the products and companies they're looking for.

Don't miss the opportunity to provide your next prospect with the information he needs to contact *you*. Place your listing in the Ocean News & Technology Ocean Industry Directory today! Listing can be changed at any time. Add your QR code to direct print readers to your website.

ANNOUNCING PRODUCT & SERVICE DIRECTORY:

Produced annually in digital format, this new comprehensive directory distinguishes between manufacturers, sellers, and rental agents. Published in early 2016, be sure to include your company by sending listing information today. www.oceannews.com/product-service-directory

SPECIAL OFFER

Companies listed in our Monthly Ocean Industry Directory will receive a free logo in the company listing section of the Product & Service Directory. Contact your representative for details.

Directory Sales:

North America:
Lisa Chilik: +1 574-261-4215
Lchilik@tscpublishing.com

International:
Mimi Shipman: +44 (0) 777 601 7564
mshipman@tscpublishing.com

ACOUSTIC SYSTEMS

Applied Acoustic Engineering Ltd
Marine House, Gapton Hall Road, Great Yarmouth. NR31 0NB, UK
Tel: + 44 (0) 1493 440355
Fax: +44 (0) 1493 440720
E-mail: gavinwilloughby@appliedacoustics.com
Website: www.appliedacoustics.com
Contact: Gavin Willoughby

Manufacturer of fully integrated USBL acoustic tracking systems, both portable and vessel based, high quality multi-system compatible beacons for acoustic positioning and release, and seismic sub-bottom profiling systems for coastal, offshore or geohazard surveys. All products are supported by a network of overseas representatives providing a first class service on a global scale.

iXBlue
Tel: +33 (0) 1 30 08 88 88
Fax: +33 (0) 1 30 08 88 00
Website: www.ixblue.com

- **GAPS USBL** acoustic positioning system
- **RAMSES** long baseline MF and LF positioning systems
- **POSIDONIA** very long range USBL system
- **ComMet** subsea metrology system
- **OCEANO** acoustic release range

iXBlue is a leading global provider of innovative solutions and services for navigation, positioning, and imaging.

Ocean Sonics Ltd.
11 Lornevale Road
Great Village, NS, B0M 1L0
Tel: +1 902 655 3000
E-mail: info@oceansonics.com
Website: www.oceansonics.com

*Ocean Sonics designs and manufactures the **icListen Smart Hydrophone**, a compact self-contained easy to deploy digital instrument. As the world leader in gathering ocean sound, Ocean Sonics combines very high signal performance with innovative ease of use to give customers the best digital hydrophone technology available. This enables users to collect, record, measure, process and interpret calibrated sound data from the ocean.*

icListen HF *10 Hz to 200 kHz*
icListen LF *1 Hz to 1600 Hz*
icListen AF *1 Hz to 12 kHz*
icTalk Calibrated Smart Projector: *10 kHz to 200 kHz*
LUCY PC software *for instrument control and data presentation*
Radio Buoy, Battery Packs and Cable solutions

RTsys
25 rue Michel Marion
56850 Caudan, France
Tel: +33 297 898 580
E-mail: info@rtsys.eu
Website: www.rtsys.eu

- *Acoustic Monitoring: EASDA14, Embedded Multichannel Passive Acoustic Recorders*
- *WiFi remote Buoy: BASDA14, Multi-sensor & Rechargeable Acoustic Buoy accessible in Real-time*
- *Sediment Characterization: INSEA, Acoustic Velocimeter for Sediment Characterization*

We provide advanced embedded acoustic products in the environmental research, surveying and monitoring areas. With Synchronized Multichannel Acquisition and accepting a broad range of Acoustic Transducers and Hydrophones from 3Hz to more than 1MHz, our solutions allow the user a new range of applications.

ADCP/DVL

Rowe Technologies, Inc.
12655 Danielson Ct.
Suite 306
Poway, CA 92064
Tel: 858 842 3020
E-mail: sales@rowetechinc.com
Website: www.rowetechinc.com
Contact: Ray Mahr

Rowe Technologies Inc. [RoweTech] specializes in the design and manufacture of underwater acoustic Doppler products and imaging systems for the oceanographic, hydrographic and hydrologic markets. Founded in 2009, Rowe Technologies is a technology-based private company with the main office located in Poway CA, USA. Rowe's ADCP/DVL electronics suite is superior to others due to a powerful compact single-unit configuration which allows simultaneous current profiling and bottom tracking.

BUOYS

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

MetOcean designs and manufactures drifting buoys, environmental platforms, and the world renowned NOVATECH locator beacon product line. MetOcean's drifting buoy family consists of environmental and weather monitoring, oil spill response, and search and rescue drifters: NOVA profiling float, Iridium SVP (iSVP), iSPHERE, Argosphere, SLDMB, and iSLDMB.

BUOYANCY PRODUCTS

DeepWater Buoyancy, Inc.
394 Hill Street
Biddeford, ME 04005
Tel: +1 207 502 1400
Fax: +1 207 221 5718
E-mail: sales@deepwb.com
Website: www.DeepWaterBuoyancy.com
Contact: Dan Cote, Sales Manager

DeepWater Buoyancy creates subsea buoyancy products for leading companies in the oceanographic, seismic, survey, military and offshore oil & gas markets. Thousands of customers have relied on our products for over thirty years, from the ocean surface to depths exceeding six thousand meters.

Subsalve USA
P.O. Box 2030
North Kingstown, RI 02852
Phone: 401-884-8801
Fax: 401-884-8868
E-mail: richard@subsalve.com
Website: www.subsalve.com
Contact: Richard Fryburg

Since 1977 Subsalve USA has been America's #1 manufacturer of standard and custom flotation devices and we are the innovators in buoyancy and engineered inflatables. Our products include: Professional, Commercial, Standard, Shallow Water, Enclosed Flotation Bags, Cable & Pipeline Floats, Water Load Test Bags, Rapid Recovery & Mark V/ORCA EOD Systems.

CABLES

South Bay Cable Corp
54125 Maranatha Drive
P.O. Box 67
Idyllwild, CA 92549
Phone: (951) 659-2183
Fax: (951) 659-3958
E-mail: Sales@southbaycable.com
Website: www.southbaycable.com
Contact: Gary Brown, Sales Manager

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.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today! +1-772-617-6787

CONNECTORS

AK Industries
3115 East Las Hermanas Street
Rancho Dominguez, CA 90221
Tel: +1 310 762 1600
Fax: +1 310 762 1616
E-mail: sales@ak-ind.com
Website: www.ak-ind.com
Contact: Allan Kidd

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

BIRNS, Inc.
1720 Fiske Place
Oxnard CA 93033-1863 USA
Int'l: +1 805 487 5393
Fax: +1 805 487 0427
USA: +1 888 BIRNS 88 (+1 888 247 6788)
E-mail: service@birns.com
Website: www.birns.com
Contact: Eric Birns

BIRNS, Inc. has been serving the subsea industry since 1954, and is an ISO 9001:2008 certified global leader in the design and manufacturing of high performance connectors, custom cable assemblies and lighting systems. With a NAVSEA PRO-020 certified molding facility, the company leads the industry with sophisticated connector lines, including exceptional electrical, electromechanical, coaxial, electro-coax, optical, electro-optical and electro-opto-mechanical hybrid options. BIRNS provides the industry's highest volume of cost-effective hydrostatic and helium pressure testing, and has a wide range of ABS Product Design Assessment (PDA) certified fiber optic and electrical penetrators. BIRNS also delivers brilliant LED and tungsten-halogen marine, chamber, security and commercial diving lights trusted in the world's most extreme environments.

BIRNS Aquamate LLC
122 Waltham St.
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, South Africa and Holland as well as dealers in Canada, Germany, Belgium, Norway, China, and Brazil.

SEACON
1700 Gillespie Way
El Cajon, CA 92020 USA
Tel: +1 619 562 7071
Fax: +1 619 562 9706
E-mail: seacon@seaconworldwide.com
Website: www.seaconworldwide.com

The SEACON 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, SEACON is able to supply very quick solutions to any requirements across the globe.

Teledyne Impulse
9855 Carroll Canyon Road
San Diego, CA 92131 USA
Tel: 1-800-327-0971 or
+1-858-842-3100
Fax:+1-858-565-1649
E-mail: impulse@teledyne.com
Website: www.teledyneimpulse.com

Teledyne Impulse designs and manufactures highly reliable electrical and optical interconnection systems for a range of harsh environments. From underwater sensor connectors, to ROV connectors, to the largest vehicle systems, Impulse products are proven performers in demanding applications, which include oceanographic exploration, defense, oil and gas production, and wastewater management.

Teledyne ODI - A Teledyne Technologies Company
1026 North Williamson Blvd.
Daytona Beach, FL 32114
Tel: +1 386 236 0780
Fax: +1 386 236 0906
Toll Free: (888) 506 2326
E-mail: ODI_marketing@teledyne.com
Website: www.odi.com

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

DESIGN AND ENGINEERING

Hydro Leduc NA, Inc.
19416 Park Row, Ste. 170
Houston, TX 77084
Tel: 281-679-9654
E-mail bogden@hydroleduc.com
Website: www.hydroleduc.com

Hydro Leduc is a specialist in the design and manufacture of hydraulic piston pumps, hydraulic motors, hydro pneumatic accumulators, and customized hydraulic components satisfying customer needs with reliable products from a reliable source. As the leader in micro hydraulics, it is feasible to obtain several tons of force from a minimal power source within a restricted space envelope. The techniques of micro hydraulics allow simple solutions to problems that are often beyond the limits of traditional mechanical options. Hydro Leduc's expertise is at your service in varied applications such as oil service tools, oceanographic instrumentation, aeronautics, and any extreme working condition of temperature, pressure, medium, and environment.

DIVING & MEDICAL TRAINING COURSES

Interdive Services Ltd & InterMedic Services UK
3 Stoke Damerel Business Centre
5 Church Street, Stoke Plymouth
Devon, PL3 4DT, Great Britain
Tel: +44 1752 55 80 80
Fax: +44 1752 56 90 90
E-mail: vanessa@interdive.co.uk or diving@interdive.co.uk
Website: www.interdive.co.uk
Contact: Ms. Vanessa Yardley

High quality marine related training courses approved by HSE, IMCA,IDSA, NPD, MCA and RYA. Training from basic to advanced levels (including hospital based) by friendly & experienced instructors. Training providers to UK Ministry of defense. Training on your site, at our facilities, inhouse or overseas. Also, experienced diver assessments and Offshore Medic course.

EQUIPMENT RENTAL

Okeanus Science & Technology, LLC
2261 Denley Road
Houma, LA 70363
Tel: 985-346-4666
Fax: 985-346-8444
E-mail: Bleblanc@okeanus.com
Website: www.okeanus.com
Contact: Benton LeBlanc

Okeanus is the premier rental provider for oceanographic and marine scientific research equipment utilized in nearshore and offshore projects around the world. Focused on providing industry-leading customer service, Okeanus offers advanced, high-quality technology coupled with knowledgeable and experienced staff that can deliver dedicated support regardless of a project's location.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today! +1-772-221-6796

FIBER OPTIC PRODUCT/SERVICES

Focal Technologies Corporation, Moog Inc.
77 Frazee Avenue
Dartmouth, Nova Scotia
Canada B3B 1Z4
Tel: +1 902 468 2263
Fax: +1 902 468 2249
E-mail: focal@moog.com
Website: www.moog.com/marine
Contact: Shawn Taylor

Focal, A Moog Inc. Company, specializes in providing electrical slip rings, fiber optic rotary joints, hydraulic utility swivels and fiber optic multiplexer solutions for the worldwide marine industry including ROV, seismic, FPSO turret and oceanographic applications. Product features include hybrid packages that combine fiber, electrical and fluid rotary joints for harsh environments.

Ocean Specialists Inc.
8502 SW Kansas Ave
Stuart, FL 34997
Tel: +1 772 219 3033
Fax: +1 772 219 3010
Email: jbyous@oceanspecialists.com
Website: www.oceanspecialists.com
Contact: Jim Byous

Ocean Specialists, Inc (OSI) is a submarine fiber optic network development company with global project capabilities. OSI works with clients during all project phases of subsea network development, from planning and design to procurement and implementation. Our customers, primarily representing Oil and Gas, Telecommunications and Ocean Observing, recognize the value of fiber optic networks to their field and services solutions, and look to OSI to deliver the skills and experience that developing these networks require.

SeaView Systems
7275 Joy Road., Suite A
Dexter, MI 48130, USA
Tel/Fax: +1 734 426 8978
E-mail: info@seaviewsystems.com
Website: www.seaviewsystems.com
Contact: Matthew Cook

SeaView Systems produces optical fiber data transmission devices designed for subsea equipment. Products include the SVS-109 Video/Data mux, SVS-209 Gbit Ethernet Converter, SVS-309 2 channel HD-SDI converter and the SVS-509 OmniData stack. SeaView also offers a wide selection of supporting OEM components and custom ROV design, integration and refurbishment services.

GYRO COMPASSES

iXBlue
Tel: +33 (0) 1 30 08 88 88
Fax: +33 (0) 1 30 08 88 00
Website: www.ixblue.com

- **QUADRANS** compact surface gyrocompass
- **OCTANS** surface gyrocompass and motion sensor
- **OCTANS NANO** compact subsea gyrocompass and motion sensor
- **OCTANS** 3000 subsea gyrocompass and motion sensor

iXBlue is a leading global provider of innovative solutions and services for navigation, positioning, and imaging.

INSURANCE

John W. Fisk Company
4833 Conti Street, Suite 200
New Orleans, LA 70119
Toll Free: +1 888 486 5411
E-mail: insure@jwfisk.com
Website: www.jwfisk.com

Fisk Marine Insurance provides all types of insurance to any limit required for commercial diving, marine contractors, offshore oilfield and platforms, plug and abandonment (P&A) contractors, land based energy, ocean marine cargo and oceanographic research worldwide. Our coverages include Workers Compensation (USL&H & Jones Act, General Liability, Professional Liability, Hull P&I, Equipment, Bonds and International Packages for clients working outside of the USA. Contact us for more information: 1-888-486-5411 or insure@jwfisk.com. Visit our website: www.jwfisk.com

LIQUID STORAGE

Aero Tec Laboratories, Inc. (ATL)
45 Spear Road Industrial Park,
Ramsey, NJ 07446 USA
Tel: +1 201 825 1400
Fax: +1 201 825 1962
E-mail: atl@atlinc.com
Website: www.atlinc.com
Contact: David Dack

ATL specializes in the design/manufacture of custom bladder-type fluid containment systems, including tanks, inflatables, pillows and bellows for surface and subsea. ATL's flexible fluid containers boast unparalleled chemical tolerance, abrasion resistance, and remarkable durability - used with methanol, diesel fuel, gases, ethyleneglycol, hydraulic fluids and chemical cleaning cocktails. Expedited deliveries are also available.

MAGNETOMETERS

Bartington Instruments Ltd
Unit 5, Thorney Leys Business Park
Witney, Oxon OX28 4GE
United Kingdom
Tel: +44 (0)1993 706565
E-mail: sales@bartington.com
Website: www.bartington.com

Bartington Instruments' products include high precision, low noise fluxgate magnetometers, gradiometers and data acquisition units for marine applications. With a reputation for performance, reliability and durability, our instruments are used for detection of magnetic anomalies such as underwater UXO, pipe and cable location, magnetic signature analysis, and oil and mineral exploration.

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.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today!
+1-772-221-6796

MARINE ENVIRONMENTAL CONSULTING SERVICES

CSA Ocean Sciences Inc.
8502 SW Kansas Avenue
Stuart, FL 34997
Tel: +1 772-219 3000
Fax: +1 772-219 3010
E-mail: gstevens@conshelf.com
Website: www.csaocean.com
Contact: Gordon Stevens

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

MOTION SENSING EQUIPMENT

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

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

Watson Industries, Inc.
3035 Melby Street
Eau Claire, WI 54703
Tel: +1 715 839 0628
Fax: +1 715 839 8248
E-mail: info1@watson-gyro.com
Website: www.watson-gyro.com
Contact: Tom Henke

Specializing in precision positioning and motion sensing systems for use in undersea cable laying, buoy and current monitoring, magnetic field measurement, yacht and ferry stabilization, remotely operated vehicles, sonar, camera and antenna stabilization, heading reference and surface ship navigation. We can customize our products to meet your specifications.

NAVIGATION & POSITIONING SYSTEMS

EvoLogics GmbH
Ackerstrasse 76
13355 Berlin, Germany
Tel: +49 (0) 30 4679 862-0
Fax: +49 (0) 30 4679 862-01
E-mail: sales@evologics.de
Website: www.evologics.de

EvoLogics provides the world's most advanced spread-spectrum underwater communication systems (S2C) with multi-channel data management, networking capability, built-in tracking and positioning functions with USBL. Data loggers, acoustic wake-up module and releasers optionally included. Deployments in offshore platforms (FPSO, ABS), environmental monitoring, defense systems, ROV and AUV operations and more. Applications include simple positioning and sensor information to transmission of underwater photos.

iXBlue
Tel: +33 (0) 1 30 08 88 88
Fax: +33 (0) 1 30 08 88 00
Website: www.ixblue.com

- **PHINS** surface and AUV INS
- **PHINS 6000** deep water subsea INS
- **HYDRINS** hydrographic survey INS
- **MARINS M-Series** first rank and submersible ships INS
- **ROVINS** subsea INS

iXBlue is a leading global provider of innovative solutions and services for navigation, positioning, and imaging.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today! +1-772-221-6796

OCEANOGRAPHIC INSTRUMENTS/SERVICES

ASL Environmental Sciences, Inc.
#1-6703 Rajpur Place, Victoria
BC, Canada V8M 1Z5
Phone: +1 250 656 0177
Fax: +1 250 656 2162
E-mail: asl@aslenv.com
Web: www.aslenv.com

ASL provides physical oceanographic consulting services and instruments. Services: flow measurement, ice studies, wave measurement and analysis, numerical modeling, and remote sensing. Products: Ice Profiler- measures ice-keel depths; Acoustic Zooplankton Fish Profiler- monitors the presence and location of zooplankton, fish or sediments; and the WERA NorthernRadar – measures surface currents and waves from shore up to 200km. ASL has a large lease pool of oceanographic instruments.

CONTROS Systems & Solutions GmbH
Wischhofstraße 1-3, Bld. 2
24148 Kiel, Germany
Tel: +49 (0) 431 260 959 00
Fax: +49 (0) 431 260 95 901
E-mail: contact@contros.eu
Website: contros.eu

CONTROS Systems & Solutions GmbH develops, produces and markets in-situ underwater sensor systems to detect hydrocarbons, pCO_2, dissolved oxygen, Total Alkalinity, and fully integrated systems down to full ocean depth to gather the most efficient and reliable data in any condition and in combination with data logging and software solutions.

Falmouth Scientific, Inc.
1400 Route 28A, PO Box 315
Cataumet, MA 02534-0315 USA
Tel: +1 508 564 7640
E-mail: fsi@falmouth.com
Website: www.falmouth.com

Sensors – Systems – Service
Falmouth Scientific, Inc. designs and manufactures precision oceanographic instrumentation and systems. Product areas include:
• Ultra-Portable Seismic Systems • Current, Wave, and Tide meters • Structural Stress Monitoring Systems • Sidescan Sonar Imaging Systems • Acoustic Transducers, Systems, and Support • Acoustic Positioning and Relocation Beacons

nke Instrumentation
rue Gutenberg
56700 Hennebont, France
Tel: +33 2 97 36 41 31
Fax: +33 2 97 36 10 12
E-mail: info.instrumentation@nke.fr
Website: www.nke-instrumentation.com

• Fresh and marine waters multiparameter probes: CTD, dissolved oxygen, turbidity, fluorescence, pH • Monitoring data loggers for atmospheric and marine corrosion, and cathodic protection • Dedicated and customized measurement and monitoring equipment for: sediment transport, underwater systems behaviour, fishing efforts and environmental parameters, intelligent networks...

Contact : Valérie Le Pen - vlepen@nke.fr or Goulven Prud'homme - gprudhomme@nke.fr
• Provor and Arvor profiling subsurface floats (ARGO project), CTD, dissolved oxygen and optical sensors; Argos and Iridium transmission. • Drifting surface buoys with temperature and GPS receiver for Surface velocity project. • Carioca drifting buoy: sea water dissolved pCO2, chlorophyll, wind speed and salinity.
Contact: Patrice Brault - pbrault@nke.fr

Nortek AS
Vangkroken 2
1351 Rud, Norway
Tel: +47 67 17 45 00
E-mail: inquiry@nortek.no
Website: www.nortek-as.com

Scientific instrumentation company developing and distributing Acoustic Doppler Current Profilers (ADCP), wave systems and current meters for use in oceans, rivers, lakes and laboratories. Products feature deployment planning software, real-time data collection and support from our technical team and provide technological solutions to offshore industries, engineers, research and renewable energy.

RBR
95 Hines Road, Ottawa
Ontario Canada K2K 2M5
Tel: +1 613 599 8900
Fax: +1 613 599 8929
E-mail: info@rbr-global.com
Website: www.rbr-global.com

Based in Ottawa, Canada and established in 1976. The company is an industry leader in the design, development and manufacture of high precision instruments for oceanographic, freshwater, groundwater and cryospheric research. Products include CTDs, small temperature or depth loggers, tide gauges, wave loggers and multi-parameter sondes.

ROMOR Ocean Solutions
41 Martha Avenue
Mount Uniacke, NS Canada
B0N 1Z0
Tel. +1 (902) 466-7000
Fax. +1 (902) 466-4880
E-mail: Sales@romor.ca
Website: www.romor.ca
Contact: Darrin Verge, President & CEO

ROMOR Ocean Solutions provides instrumentation solutions for the geophysical, oceanographic, defense, security, oil & gas, and renewable energy industries. By partnering with world renowned manufacturers, ROMOR is able to offer technical knowledge, value added services, logistics expertise, and the most reliable instrumentation on the market.

Sea and Land Technologies Pte Ltd
65 Tuas Avenue 1
Singapore 639508
Tel: +65 65180777
Fax:+65 65630366
E-mail: enquiry@sea-landtech.com
website: www.sea-landtech.com

A leading solutions provider in South East Asia and Australia for Oceanography, Meteorology, Hydrography, Hi Resolution Geophysical studies, Coastal Monitoring, Hydrology and Environmental surveys. Our proficiency is in providing the latest sensing technology and software solutions to meet the specific needs of the industry. Representing top manufacturers for over 20 years, SALT seamlessly blends value added services like calibration, system integration, training, repairs, cable moulding services with the technology products to offer a diverse range of innovative solutions for the user community in the region. Headquartered in Singapore, SALT has offices in Malaysia, Indonesia, Thailand, Philippines and Australia. Rental systems are available.

Sea-Bird Scientific
13431 NE 20th St.
Bellevue, WA 98005
Tel: +1 425 643 9866
Fax: +1 425 643 9954
E-mail: info@sea-birdscientific.com
Website: www.sea-birdscientific.com
Contact: Calvin Lwin, Sales

Sea-Bird Scientific, comprised of Sea-Bird Electronics, WET Labs, and Satlantic, provides integrated solutions to customers' measurement needs. Sea-Bird Scientific is the leader in accurate, stable ocean instruments for measuring conductivity (salinity), temperature, pressure, oxygen, pH, chlorophyll, CDOM, turbidity, beam attenuation, irradiance, radiance, PAR, nitrate, and phosphate. Our CTD profilers, water samplers, moored CT recorders, wave/tide recorders, DO sensors, and optical sensors are used by research institutes, ocean observing programs, government agencies, and navies globally.

Star-Oddi
Skeidaras 12, 210
Gardabaer, Iceland
Tel: +354 533 6060
Fax: +354 533 6069
E-mail: baldur@star-oddi.com
Website: www.star-oddi.com
Contact: Baldur Sigurgeirsson

A manufacturer of miniature data loggers with sensors as temperature, depth/pressure, salinity, tilt/acceleration, compass direction/magnetometer, light levels, acoustic receiving/transmitting. The loggers are used for various researches, including oceanography, fishing gear studies, equipment behavioral monitoring and fish tagging. Data is presented in the application software with a time-stamp for each measurement.

SubCtech GmbH
Wellseedamm 3,
24145, Kiel, Germany
Tel: +49 (0) 431/22039880
Fax: +49 (0) 431/22039881
E-Mail: sales@subctech.com
Website: www.subctech.com
Contact: Stefan Marx

SubCtech GmbH develops, produces and sells professional environmental and conditional monitoring equipment as well as Li-Ion based power solutions. Core products are pCO_2 analyzer, Li-Ion rechargeable batteries, subsea data logger and control equipment for different platforms. We provide reliable customized solutions for ships, buoys and ROVs/AUVs for full ocean depth.

Turner Designs
845 W Maude Avenue
Sunnyvale, CA 94085
Phone: +1 408 749 0994 x146
Toll Free: +1 877 316 8049 x146
Fax: +1 408 749 0998
Contact: Tom Brumett, Sales Engineer
E-mail: sales@turnerdesigns.com
Website: www.turnerdesigns.com

Providing fluorescence-based solutions for research, water quality, and pollution control for over 40 years. Known for reliable and stable submersible, field, handheld, laboratory, and online fluorometers and turbidimeters. Customers rate us an average of 9.4, on a scale of 1-10, when asked how likely they would be to recommend us.

SONAR SYSTEMS

iXBlue
Tel: +33 (0) 1 30 08 88 88
Fax: +33 (0) 1 30 08 88 00
Website: www.ixblue.com

- **JH 200, JH 250, JH 500** very low frequency transducers
- **SAMS-DT-6000** deep tow synthetic aperture sonar
- **SEAPIX 3D** multibeam sonar

iXBlue is a leading global provider of innovative solutions and services for navigation, positioning, and imaging.

L-3 Klein Associates, Inc.
11 Klein Drive
Salem, NH 03079
Tel: +1 603 893 6131
Fax: +1 603 893 8807
E-mail: Klein.Mail@L-3com.com
Web: www.L-3Klein.com
Contact: Deborah Durgin, Supervisor, Marketing & Sales

L-3 Klein is the world's leading sensor technology provider that manufactures and designs high-resolution side scan and multi-beam sonar equipment, and radar-based security and surveillance systems. L-3 Klein has developed a worldwide reputation of excellence in the industry by providing quality products and excellent customer service. Please feel free to check out our product offerings at www.L-3Klein.com.

Marine Sonic Technology
120 Newsome Dr. Suite H, PO Box 1309
Yorktown VA 23692-1309
Toll Free: +1 800 447 4804
E-mail: jdemille@marinesonic.com
Website: www.marinesonic.us

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

SOUND VELOCITY PROBES/CTDS

SAIV A/S
Nygardsviken 1, 5164
Laksevag, Norway
Tel: +47 56 11 30 66,
Fax: +47 56 11 30 69
E-mail: info@saivas.no
Website: www.saivas.no
Contact: Gunnar Sagstad

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

• Precision pressure /depth (0.01% accuracy) and temperature sensors/recorders. Applications: hydrographic profilings, installation on ROVs and towed systems, etc. Robust and compact designs are combined with accuracy and "plugand play" compatibility. Output format for sonar equipment, e.g. EM1002, EM3000, SSP, HiPAP and Reson 8125.

SUB-BOTTOM PROFILES

iXBlue
Tel: +33 (0) 1 30 08 88 88
Fax: +33 (0) 1 30 08 88 00
Website: www.ixblue.com

- **ECHOES 3500 T3 and T7** high penetration sub-bottom profilers
- **ECHOES 5000** full ocean depth sub-bottom profiler
- **ECHOES 10000** shallow water sub-bottom profiler

iXBlue is a leading global provider of innovative solutions and services for navigation, positioning, and imaging.

SUBSEA FABRICATION

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.

SUBSEA TOOLING

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

Subsea Americas (SSA) is a leading provider of rental ROV tooling equipment on a worldwide basis. SSA is a 24 hr. / 7 days a week service provider of a comprehensive range of standard subsea tooling equipment. From torque tools and flying lead orientation tools to 15k isolated hydraulic intensifiers and wire rope cable cutters - SSA can fully support the client's needs with quality service, and reliable equipment at a most competitive cost.

UNDERWATER VEHICLES/AUVS

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 250 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.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today!
+1-772-221-6796

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.

Oceaneering International, Inc.
11911 FM 529
Houston, TX 77041
Tel: 713.329.4500
E-mail: info@oceaneering.com
Website: www.oceaneering.com
Contact: Bill Mallin

Oceaneering is the subsea connection specialist. We are connecting what's needed with what's next as the world's largest ROV operator and the leading ROV provider to the oil and gas industry with over 300 systems operating worldwide. We push the limits of ROV intervention and meet new, demanding tooling intervention.

QSTAR ROV Training & Subsea Services
C/ Sucre 26, 35008 - C/Medas 4-6, 08023
Canary Islands & Barcelona, Spain
Tel: + 34 616 604 778 / + 34 928 91 48 13
Fax: +34 928 91 48 13
E-mail: info@qstar.es
Websites: www.qstar.es & www.rovs.eu

QSTAR was established to offer services for industries that require effective solutions for Subsea projects through the use of our ROV fleet and high Qualified personnel. Our World leading ROV Training Division offers High Quality Training for ROV PILOT TECHNICIANS as a World-Wide ROV Training Establishment Member of the IMCA.

Outland Technology
38190 Commercial Ct.
Slidell, LA 70458 USA
Tel: 985-847-1104
Fax: 985-847-1106
E-mail: jeff@outlandtech.com
Website: www.outlandtech.com
Contact: Jeff Mayfield

Offering the most rugged equipment and unsurpassed customer service, Outland Technology has been the world's leading manufacturer of underwater video, lighting and ROV equipment for over 30 years. We recognize that no two jobs are the same and specialize in products that are customizable for your specific applications.

Teledyne SeaBotix
2877 Historic Decatur Road, Suite 100
San Diego, CA 92106 USA
Tel: +1 619 450 4000
Fax: +1 619 450 4001
E-mail: SeaBotixInfo@Teledyne.com
Website: www.SeaBotix.com
Contact: Alasdair Murrie

Teledyne 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.

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 3,500 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
E-mail: 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.

WINCHES, HANDLING & CONTROL SYSTEMS

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
Website: www.hawboldt.ca
Contact: Paul Phillips

Hawboldt Industries has built robust commercial and scientific deck machinery for over a century, focusing on custom winch solutions and satisfying project requirements from engineering to commissioning. ROV winches, A-frames, and electro-hydraulic power packs are available to satisfy the offshore and subsea markets. Our scientific winches, preferred by universities and governments worldwide, are renowned for their durability and performance particularly in harsh environments.

Markey Machinery Company
7266 8th Ave. South
Seattle, WA 98108 USA
Tel: +1 800 637 3430
Fax: +1 206 623 9839
E-mail: info@markeymachinery.com
Website: www.markeymachinery.com

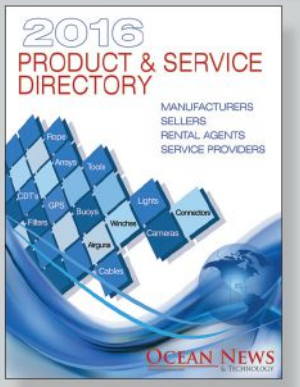
Preferred by the US fleet, Markey's advanced oceanographic winch systems provide ultimate dependability, reliability and precise performance when and where you want it. Operating within critical windows of opportunity you can count on our custom winches, capstans, windlasses and auxiliary machinery for the successful execution and completion of your research.

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

MECHANICAL HANDLING UNDERWATER
Launch and Recovery Systems - 6,000m plus Underwater Winches - ROV and Diver operated Tether Management Systems - 6,000m plus Torque Tools - Electric and Hydraulic systems - ROV and Diver operated General Products - Compensators, latches, swivels, metrology sets, cable reels, pressure housings, junction boxes Workshop Services - Fabrication, assembly and testing Engineering - prototyping, product development, solutions engineering AC-ROV - The mini ROV that broke the mold.

Available in Spring of 2016
Don't Miss Out...
2016 PRODUCT & SERVICE DIRECTORY



FREE LISTINGS

Reach the Industry

Place an ad in Ocean News & Technology's 2016 Product & Service Directory today!

Your ad can be updated for mid-year redistribution of the Directory

Your product or service listing will be seen by ON&T's broad audience in our diverse marketplace:

Offshore Oil & Gas • Ocean Science • Defense • Ocean Renewables • Marine Environment

visit www.oceannews.com/product-service-directory

Ocean News & Technology
TSC Media & Events
www.oceannews.com • 772-221-7720

ADVERTISER INDEX

Bartington Instruments Limited. ..... 35 ..... www.bartington.com
BIRNS, Inc. ..... 21 ..... www.birns.com
CSA Ocean Sciences Inc. ..... 4 ..... www.csaocean.com
CUCE ..... 71 ..... www.cuce.ca
Cygnus Instruments ..... 84 ..... www.cygnusinstruments.com
ECO Magazine ..... 53 ..... www.ecomagazine.com
EvoLogics GmbH ..... 83 ..... www.evologics.de
FORUM Energy Technologies, Inc. (F.E.T.) ..... 9 ..... www.f-e-t.com
Global Ocean Design ..... 51 ..... www.globaloceandesign.com
GoM Oil Spill & Ecosystem Science Conference ..... 70 ..... www.gulfofmexicoconference.org
Hydroid, Inc. ..... 5 ..... www.hydroid.com
Hydro-Lek ..... 18 ..... www.hydro-lek.com
Imagenex Technology Corp ..... 3 ..... www.imagenex.com
InterOcean Systems, Inc. ..... 40 ..... www.interoceansystems.com
JW Fishers Manufacturing, Inc. ..... 31 ..... www.jwfishers.com
L-3 Communications Klein Associates ..... 23 ..... www.L-3Klein.com
LinkQuest, Inc. ..... 29 ..... www.link-quest.com
New Industries ..... 37 ..... www.newindustries.com
Nortek AS ..... 7 ..... www.nortek-as.com
OceanAero ..... 59 ..... www.oceanaero.us
Oceaneering International ..... 32 ..... www.oceaneering.com
Ocean News ..... 69, 73, 74, 81 ..... www.oceannews.com
OceanServer Technology ..... 27 ..... www.ocean-server.com
Ocean Specialists, Inc. ..... 57 ..... www.oceanspecialists.com
Ohmsett ..... 47 ..... www.ohmsett.com
Okeanus Science & Technology ..... 43 ..... www.okeanus.com
Quest Offshore Resources, Inc. ..... 54 ..... www.questoffshore.com
Radar Screen Report ..... 60 ..... www.subcableworld.com/radar-screen-report
RJE International ..... 55 ..... www.rjeint.com
ROVSCO, Inc. ..... 41 ..... www.rovsco.com
Saab Seaeye Ltd ..... 49 ..... www.seaeye.com
SeaRobotics ..... 51 ..... www.searobotics.com
Shark Marine Technologies, Inc. ..... 45 ..... www.sharkmarine.com
SonarTech Co., LTD ..... 47 ..... www.SonarBeam.co.kr / www.sonartech.com
Submarine Cable Newsfeed ..... 60 ..... www.subcableworld.com
Subsalve USA ..... 25 ..... www.subsalve.com
SubCtech GmbH ..... 59 ..... www.subCtech.com
Teledyne AG Geophysical Products ..... 61 ..... www.aggeophysical.com
Teledyne Cable Solutions ..... 61 ..... www.teledynecablesolutions.com
Teledyne Cormon ..... 61 ..... www.cormon.com
Teledyne DGO ..... 61 ..... www.dgo.com
Teledyne Impulse ..... 61 ..... www.teledyneimpulse.com
Teledyne ODI ..... 61 ..... www.odi.com
Teledyne Oil & Gas ..... 61 ..... www.teledyneoilandgas.com
U.S. Underwater Services, LLC ..... 20 ..... www.usunderwaterservices.com
Valeport Limited ..... 42 ..... www.valeport.co.uk
VideoRay ..... 2 ..... www.videoray.com
Woods Hole Oceanographic Institution ..... 55 ..... www.whoi.edu

S2C TECHNOLOGY: COMMUNICATION AND TRACKING COMBINED

- time, space and cost-saving solutions
- low power consumption for autonomous operations
- advanced data delivery algorithms, addressing and networking, remotely configurable settings
- extendable platform with multiple configuration options: power-saving Wake Up module, acoustic releaser, additional sensors, custom solutions, OEM versions availableh

USBL POSITIONING SYSTEMS

simultaneous positioning and communication - no need to switch between positioning mode and modem mode

- flexible SiNAPS positioning software
- reliable data transmissions
- range: up to 8000 m
- accuracy: up to 0.04 degrees

LBL POSITIONING SYSTEMS

highly accurate, precise and stable performance, simultaneous positioning and data transmissions

- flexible SiNAPS positioning software
- reliable data transmissions
- range: up to 8000 m
- accuracy: better than 0.01 m

UNDERWATER ACOUSTIC MODEMS

reliable data transmissions even in adverse conditions, customizable R-series modems, light and compact M-series "mini" modems, **new S2CM-HS high-speed modem**, special editions for developers, S2C communication and positioning emulator - remote access or standalone device

- range: up to 8000 m
- depth: up to 6000 m
- data rate: up to 62.5 kbps

Meet us at
OCEANOLOGY INTERNATIONAL 2016!
15-17 March 2016
London, ExCel
Stand C251

EvoLogics GmbH
Ackerstrasse 76,
13355 Berlin, Germany

tel.: +49 30 4679 862-0
fax: +49 30 4679 862-01

sales@evologics.de
evologics.de

CYGNUS INSTRUMENTS

"Simplicity through technology"

Cygnus Dive 2

Measures metal thickness to determine wastage or corrosion accurately, quickly and without removing protective coatings.

T: 410-267-9771 E: sales@cygnusinstruments.com W: www.CygnusInstruments.com