Underwater Imaging • RFQ for IOOS • Underwater Intervention 2006 Preview

MARINE TECHNOLOGY REPORTER

January 2006
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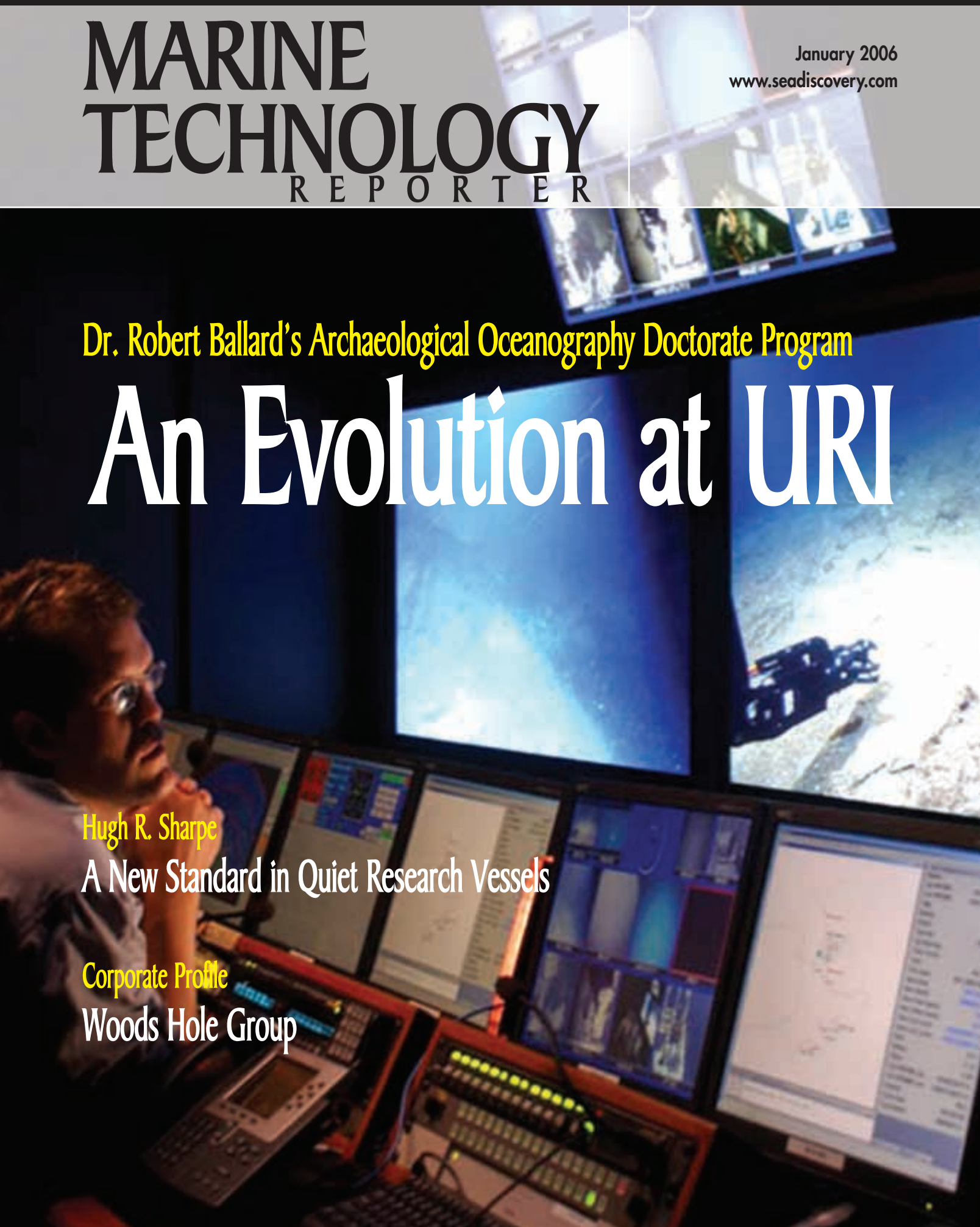

Dr. Robert Ballard's Archaeological Oceanography Doctorate Program

An Evolution at URI

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SouthCoast MASSACHUSETTS
THE NEXT WAVE

January 2006

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In the Background: The Inner Space Center at the University of Rhode Island allows scientists to 'participate' in at-sea missions from shoreside, with the capabilities of "tele-presence" technology. Dr. Robert Ballard, Dr. Steve Hammond

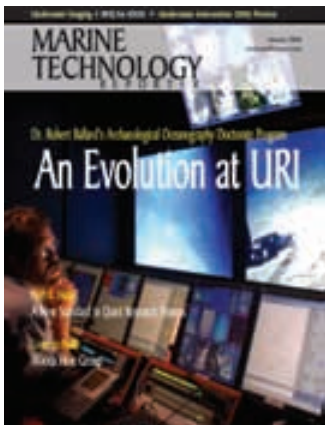
on the Cover

The Inner Space Center at the University of Rhode Island is a groundbreaking medl of technologies designed to introduce the new exploratory paradigm based upon "tele-presence" technology. Details of the system is included in the profile of Dr. Robert Ballard's new Archaeological Oceanography doctorate program, starting on page 22. It is also the subject a feature article written by Dr. Robert Ballard, Dr. Steve Hammond, and Dr. Larry Mayer, to be published in the March 2006 edition of Marine Technology Reporter.

the Authors

Maggie Linskey Merrill is the founding editor and publisher of *Marine Technology Reporter*. She has 20 years experience communicating marine science, technology, environmental and engineering news and information. She has held positions at the Woods Hole Oceanographic Institution, Massachusetts Institute of Technology, HA Perry Foundation and Sea Data Corporation. In 1993 she founded *MTR* and the Marine and Oceanographic Technology Network (MOTN). **(Story on page 28)**

also in this Edition



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editorial

Maggie Merrill and I had the opportunity recently to spend half of a day with Dr. Robert Ballard and two of his students, Katy Croft and Mike Brennan, at the University of Rhode Island Narragansett Bay Campus campus, to discuss Dr. Ballard's new Archaeological Oceanography program. What we found is a mentor determined to attract the brightest minds, to develop and deploy the best technologies, to challenge the status quo and lay the groundwork for oceanographic study for a generation to come.

Greg Trauthwein
Associate Publisher & Editor • trauthwein@marinelink.com

Editorial Index

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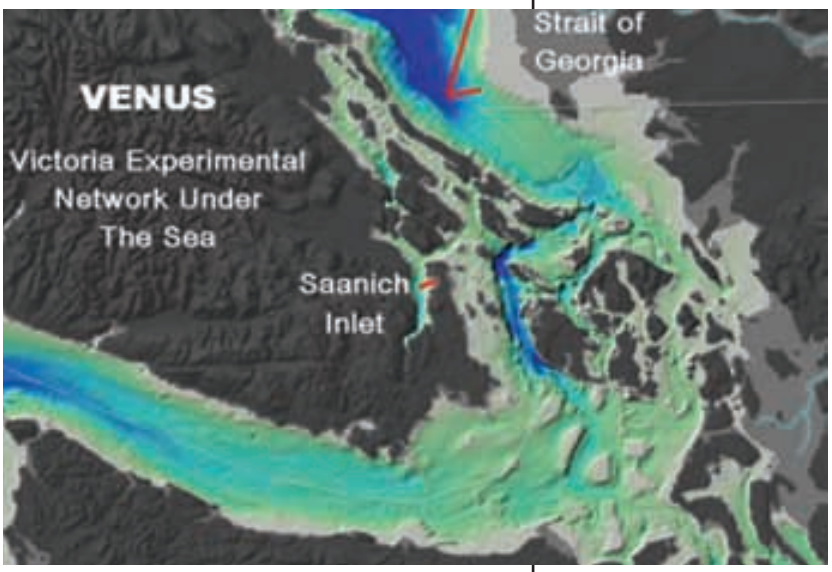
Seafloor Observatory launches in British Columbia

Global Marine Systems Limited, in partnership with The University of Victoria, in November 2005 launched the Victoria Experimental Network Under the Sea (VENUS) project. VENUS is intended to pioneer the use of fiber-optic cabling technology to provide a real-time data feed of images, sound and scientific measurements from the sea floor. The project is based in the waters around Southern Vancouver Island, starting with the Saanich Inlet and will then move onto the Strait of Georgia.

VENUS is intended to provide a breadth of real-time data that will cover areas including ocean physics, sediment studies, the biological distribution and interaction between marine life, bioacoustics, fish migratory patterns and plankton distributions. The scientific node, which enables the seafloor observatory to process this diverse range of data, was provided by the Canadian firm OceanWorks, who specialize in manned and unmanned subsea work systems.



"The VENUS project represents a step change for the world of marine science and oceanography, which will help improve the way marine scientists observe oceans in the future," said Dr. Phil Hart, Director of Engineering at Global Marine. "Current

RFQ for IOOS: Sources Sought for Engineering Services

Attached is a just released RFQ seeking firms to bid on two $1M contracts to propose designs for the Integrated Ocean Observing System.

The National Oceanic & Atmospheric Administration, a bureau of the U.S. Department of Commerce, has issued a Request for Quote (RFQ) for Integrated Ocean Observing System (IOOS) products and services (attached). IOOS as defined in an interagency development plan as a coordinated national and international network of observations and data transmission, data management and communications (DMAC), data analysis and modeling that systematically and efficiently acquires and disseminates data and information on past, present and future states of the oceans and U.S. coastal waters to the head of tide. The IOOS products and services will be procured through the General Services Administration (GSA) Federal Acquisition Service (FAS), Multiple Award Schedule (MAS) entitled "Professional Engineering Services," and Special Item Number 871-3 entitled "System Design, Engineering and Integration," RFQ Number 123298. The posting is available on www.ebuy.gsa.gov, accessible through company or agency Procurement offices. Award of two Delivery Orders is contemplated.

For questions or further information about any aspects of this procurement, contact Pauline Jaffe at Pauline.jaffe@noaa.gov, or (301) 713-8023x207.

data collection methods provide a snapshot view only, whereas the VENUS observatory can be considered as being like a continuous film, which will allow more reliable long term observations to be made. Global Marine is delighted to be working with The University of Victoria on the VENUS project and is keen to be an active player in the broader underwater observatory market," he added.

"The installation of the VENUS observatory is a scientific milestone for UVic, for Canada and indeed for the world," said The University of Victoria President Dr. David Turpin. "VENUS builds on UVic's recognized strengths in ocean sciences and we're very proud of the hard work, strong partnerships, and innovative thinking that have brought us to this exciting threshold."

The VENUS project broadcast starts in early January 2006 and can be viewed live at www.venus.uvic.ca.

Navy MCM Divers Conduct Training with French Navy

U.S. Navy Special Clearance Team (NSCT) 1 participated in a training exercise with the French navy's mine clearance divers, December 7 off the coast of Point Loma, California.

The training allowed the French to learn from and observe NSCT 1's very shallow water MCM (mine countermeasures) divers and their various platoons. In February, members of NSCT 1 will travel to Toulon, France, to switch roles and observe the French divers and their MCM tactics, and participate in an amphibious exercise with the French navy. "Conducting cross-training with the French is important to the U.S. Navy," said Lt. John M. Schiller, NSCT 1's training officer. "If utilized as a combined task unit, we have an understanding of each other's capabilities and tactics; techniques and procedures."

NSCT 1's mission is to conduct low visibility underwater mine and obstacle reconnaissance and clearance operations from over the horizon to the seaward edge of the surf zone.

The French arrived November 30 and stayed for 10 days. The first week was spent exercising with NSCT 1 and touring the different platoons, such as their Unmanned Underwater Vehicle, Unmanned Aerial Vehicle, and the U.S. Navy Marine Mammal platoon (NMM). NMM uses trained dolphins to detect and mark underwater mines so they later can be avoided or removed. The biological sonar of dolphins, called echolocation, makes them uniquely effective.

"We're here to learn other techniques," said Hugues Nagy, one of the 11 members of the French navy's shallow water diving team. "We still have a lot to learn, but out of all the countries we've trained with, we have the most to learn from the United States."

By Photographer's Mate 2nd Class Patricia Totemeier, Fleet Public Affairs Center Pacific

A diver assigned to the Navy's Special Clearance Team One (NSCT-1), returns to his boat for extraction during a joint training exercise with the French Navy.
(U.S. Navy photo by Photographer's Mate 1st Class Alan Warner)

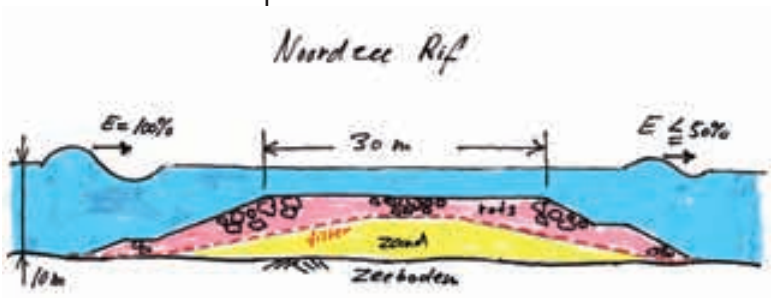
Korea Develops AUV

The Korea Ocean Research and Development Institute (KORDI) has developed a deep-sea autonomous underwater vehicle (AUV) that can operate in the depths of 6,000 m. The project was initiated in 2001 at a total project expenditure of $11.7 million.

Construction of the remotely operated vehicle (ROV) will be completed in March 2006 and the inaugural test of its performance will be conducted in April in depths of 2,000 m around Ulleung Island, 87 km east of the Dokdo islets in the East Sea. The vehicle will be launched in the Pacific in September 2006 to survey South Korea's mining zone between the Clarion and Clipperton islands that was allotted by the International Seabed Authority.

The AUV is an unmanned deep-sea explorer that prospects for gas, minerals and other natural resources, while gathering related data.

Artificial Reef Off Dutch Coast Studied



The Directorate-General for Public Works and Water Management (Rijkswaterstaat) and Royal Haskoning signed a declaration in which both parties agree to study the feasibility of artificial reefs off the Dutch coast. The construction of artificial reefs in the North Sea is a plan that Royal Haskoning launched last summer with a view to protecting the coasts of North and South Holland against the sea. Royal Haskoning has already had experience of with the concept of artificial reefs as a means of coastal defense in Dubai. Bert Keijts (Director General of Rijkswaterstaat) and Jan Bout (Chairman of the Board of Management of Royal Haskoning) (pictured) signed the declaration during the Innovation Show in Maarssen. Both parties say that they believe the idea of reefs is an interesting option for keeping the Netherlands dry and safe. The feasibility study for man-made reefs in the North Sea will be phased. Each phase will end with a go/no-go moment before the next phase starts. The man-made reefs that are planned can help reduce heavy waves to normal proportions, protecting the coast during westerly storms. The reefs lie under the water and are built of natural materials. There are three alternatives for the reefs, varying in length, number and distance from the coast.

www.royalhaskoning.com

IOOS $2M RFQ Industry Day

The IOOS products and services will be procured through the General Services Administration (GSA) Federal Acquisition Service (FAS), Multiple Award Schedule (MAS) entitled "Professional Engineering Services", and Special Item Number 871-3 entitled "System Design, Engineering and Integration", RFQ Number 123298. The posting is available on www.ebuy.gsa.gov , accessible through company or agency Procurement offices. Award of two Delivery Orders is contemplated.

DETAILS: January 20 10:00 a.m. - 12:30 p.m., Bldg 3, Rm 4529 NOAA Complex Silver Spring. Registration required: CONTACT Pauline.jaffe@noaa.gov, or (301) 713-8023x207.

India's New Research Vessel

India will acquire by September 2007 a state-of-the-art research vessel for ocean research and deepsea mining. The vessel will be used for various technology demonstration programs like deepsea mining, demonstration of remotely operated vehicles, autonomous underwater vehicle and oceanographic surveys. Sources said the government has been implementing the Polymetallic Nodules Program for exploration and development of relevant technologies in the Pioneer area allotted to India in Central Indian Ocean Basin for potential exploitation of polymetallic nodules from deep sea. A crawler based shallow bed sand mining system was developed for sand mining at a water depth of 410 m.

New Tech for Exploring Hydrothermal Vents

Advances in undersea imaging systems, the development of new vehicles and instruments, and improved seafloor mapping capabilities have enabled scientists to explore areas of the deep sea in unprecedented detail.

One such area is the TAG hydrothermal mound in the North Atlantic Ocean, one of the largest known mineral deposits on the seafloor.

Rob Reves-Sohn, a geologist at Woods Hole Oceanographic Institution, recently discussed some of the technological advances at a American Geophysical Union meeting in San Francisco.

TAG, short for Trans Atlantic Geotraverse, is on the Mid-Atlantic Ridge about 1,900 miles east of Miami at 26°8'N and 44°49'W more than two miles below the ocean's surface.

Since hydrothermal vents were discovered in 1977 on the Galapagos Rift in the eastern Pacific Ocean, vent sites have been found on the mid-ocean ridge around the world.

New sites are found each year, each with unique animal communities and geological and geochemical features. TAG was among the first to be found in the North Atlantic 20 years ago.

Using two-dimensional maps produced from data collected by a research vessel, Reves-Sohn and colleagues produced computer animations of the TAG site, enabling scientists to view it from different perspectives.

Images of the mound and smokers were taken by cameras mounted on the three-person submersible Alvin, operated by WHOI.

For centuries, people have mined copper, gold and precious metals on land from mineral deposits that many believe formed on the ocean floor.

At the TAG vent site, a superheated mixture of seawater and toxic chemicals hot enough to melt lead billows out of the seafloor.

This fluid, driven by heat from molten magma deep below the earth's crust, erupts into clouds or plumes that rise nearly 1,000 feet above the ocean bottom.

Chemical reactions occurring as this hot fluid mixes with cold seawater cause the formation of chimney-like structures called "black smokers."

These freestanding chimneys, which commonly reach heights of 100 feet or more, contain minerals similar to those mined on land.

Oi06 Set for London

Show organizers report that the exhibition space for Oceanology International 2006 is more than 95 percent sold, as the exhibition sets to take place in London in March. The exhibition and conference will be held at the ExCeL (Exhibition Center London) in the Docklands, beside the Thames and the Royal Victoria Dock. Scheduled for March 21-23, 2006, it is expected to attract a global audience of policy makers, industrialists, senior government representatives, decision-makers, researchers, directors, managers, scientists, engineers and manufacturers involved in every aspect of the oceanographic community.

The Oi06 Conference Chairman is Dr. Richard Spinrad, Assistant Administrator of NOAA's National Ocean Service. Full details can be found at: www.oilondon.com/conference/

The organizers intend for Oi06 to be a forum for ocean scientists, engineers, end users and suppliers, researchers, and policy-makers to present their latest research results, state-of-the-art technologies, future ideas, and innovative concepts to the global ocean community.

"This year's theme will examine the exciting integration and interplay between science, technology, policy, data management and society," said Dr. Spinrad. "This cutting-edge conference program will include plenary presentations and discussion panels spanning the issues: Ocean Resource Management and Global Stewardship, Natural Hazards, Security and Safety, and Precision Position and Navigation.

These four themes will provide an unequalled opportunity to think about specific ocean-related issues from the societal perspective. Presenters will highlight aspects of science, technology, policy, and/or data management in each of the four tracks."

www.oi06.com

Bulk Carrier to be Converted to Pipe Layer

Keppel Verolme BV signed new contracts totaling $134 million from Swiss-based Allseas Group and Sevan Production. One of the Allseas contracts is for the conversion of the 2005 Panamax bulk carrier Geeview into a pipelay vessel Audacia, capable of operating in ultra-deep water in the range of 3,000 m water depth. New engine rooms, thrusters, additional cranes and accommodations are included in the workscope. Geeview was to arrive at the Keppel Verolme shipyard in early December 2005. The delivery of the completed pipelay vessel is expected in October 2006.

Keppel Verolme also received a contract from Sevan Production to carry out the outfitting of the Sevan Stabilized Platform SSP Piranema, a Floating Production Storage Offloading (FPSO) vessel with oil storage capacity of 300,000 barrels, an oil processing capacity of 30,000 bpd and a gas injection capacity of 3.6 million cubic meters per day.

The SSP Piranema hull and accommodation block are currently under construction in a yard in China and are expected to arrive at the Keppel Verolme during first quarter of 2006. The completed unit is scheduled to reach offshore Brazil in mid-2006.

GEO Delivers Seismic Vessel

By Larry Pearson

Global Geophysical Services, Inc., of Houston, Texas — incorporated in 2003 specifically for geophysical work — earlier this summer received a 70 x 22-ft. (21.3 x 6.7 m) catamaran-style new seismic vessel from Geo Shipyard, New Iberia, La. "In the past, we specialized in seismic boats and our company name is derived from our concentration on geophysical vessels," said David LeCompte, president of the company.

The vessel is equipped with a pair of large compressors enabling it to operate air guns that gather seismic data from the Gulf of Mexico.

"This source vessel is unique in that it has a lot of source energy, backed by large compressors all packaged on a shallow draft catamaran-style vessel," said Richard Degner, president and CEO of Global Geophysical.

The driving force behind the development of this vessel is the lure of finding large deposits of gas in shallow water in the Gulf of Mexico. "The great success many companies are experiencing in the deep water of the Gulf of Mexico has led to searching for large gas deposits in shallow water but at much greater depths in the earth," Degner said.

"Years ago exploration leases were down to 15,000 ft., but now there is a lot of activity in leases permitting drilling to 30,000 ft. and that has the potential of revitalizing the shallow water Gulf of Mexico market," Degner said.

"To drill to those depths, companies need very high resolution data and larger source energy so that signal to noise ratios and wave reflections at these great depths are still adequate to provide quality seismic data," Degner added.

"Technology has significantly reduced the cost of obtaining seismic data," Degner said. "The electronics have become much more reliable, more com-

One of the two identical air compressors before being installed on the James H. Scott.

The James H. Scott on sea trials near the builder's shipyard. The catamaran design makes for an inherently stable vessel.

pact, use less energy and are a lot lighter in weight," Degner said.

Global Geophysical will use the James H. Scott as the source vessel in the search for gas at these extreme depths. A source vessel uses air guns in an array towed behind the boat to send sound waves deep into the bottom of the Gulf of Mexico. A second vessel maps the sound wave reflections to provide a 'picture' of the geology of the area that may contain gas deposits. The towed array travels at a depth consistent with the information that is being gathered.

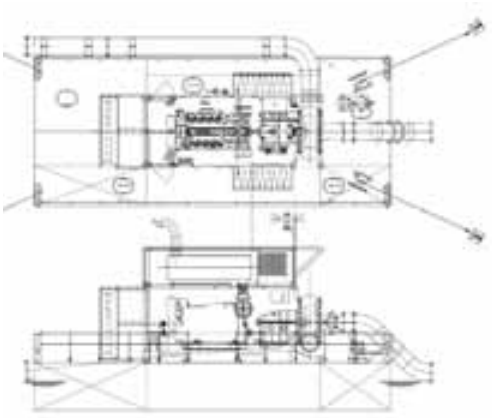
Geo Shipyard built the James H. Scott from marine aluminum. It is powered by a pair of Luggar 600 hp engines driving NiBrAl propellers through ZF gears, driving it to a speed of 11 knots. A pair of Northern Lights 40 kW gensets provide ship's power. Each catamaran hull has a main engine, gear, shaft, propeller and genset. At the heart of the vessel are two NCA compressors delivering 600 cfm of air at 2,000 psi to operate the air guns. Typically, the towed array uses 3-4 "strings" with several air guns per string.

Seismic work can often last for several days. The James H. Scott has two staterooms with six bunks (one four person room and one two person room) for the crew operating the vessel and the towed array. A head is located in the hull as well with a toilet, shower and sink. The vessel also has a small galley in the pilothouse as well as the control and navigation stations. Fuel capacity for the James H. Scott is 5,000 gallons with tanks for 200 gallons each of black and potable water. A 180 gal./day water maker replenishes the potable water tank for crew consumption.

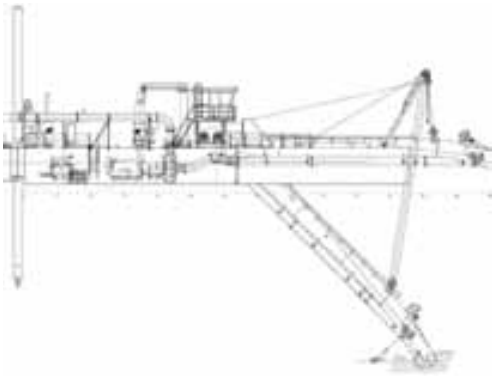
Vosta LMG Contract for Diamond Dredge

Vosta LMG received a contract for a CSD550, a booster station and critical spare parts from Namdeb Diamond Corporation in Namibia. The cutter suction dredge and booster station are part of an investment plan of Namdeb into mining reserves in the northern part of their concession. The vessel will be used to dredge overburden overlaying course gravels, which contain diamonds. The maximum dredging depth will be 15 m, and the overburden will be discharged over a pipeline system with a length up to 2000 m.

Vosta LMG is currently investigating which partner shipyard to use for this project. Also, suppliers for the hydraulic installation and other sub systems are being selected. It will be equipped with a Vosta SC10 cutting system and a spudcarrier system. Vosta is planning to deliver the dredge in the summer of 2006.



CSD550 and Booster Station will be delivered to dredge for diamonds.



Dredge specifications:

Length o.a.	51.8 m
Length over deck	40 m
Breadth molded	8.5 m
Depth pontoon	2.8 m
Max. dredging depth	15 m
Installed power	1,299 kW
Cutter power	175 kW
Pump power	950 kW

A New Standard of Quiet

University of Delaware's new research vessel the Hugh R. Sharpe. Inset picture of the ship's bridge

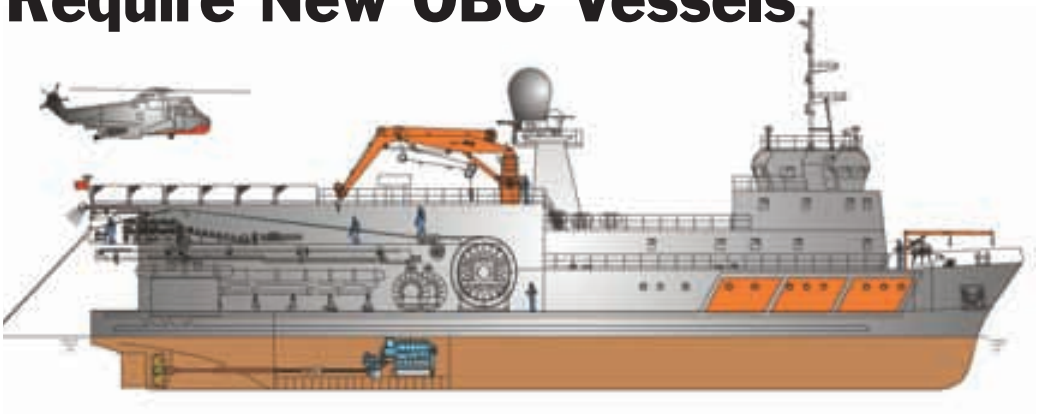
Institutions throughout North America are paying a lot of attention to the University of Delaware's new research vessel the Hugh R. Sharpe recently delivered from Dakota Creek Industries from Anacortes Wash. The vessel is fitted with retractable transducer pod, articulating stern gantry, wet lab, dry lab, forward gear deployment boom and a CTD handling system. It incorporates in one vessel many of the most sought after features found on scientific research vessels around the world. But it is the propulsion system that is setting the new standard in American research vessels.

The 146 x 32-ft. (44.5 x 9.75-m) diesel electric vessel is powered by four Cummins KTA19 -D(M1)-powered electric generators. The generators power two 483 kW, 600v dc propulsion motors mounted to a pair of Schottel Z-drive stern-mounted propulsion units. Although the vessel has a 12-knot cruising speed it can be operated in

"quiet mode" at eight knots. Shutting down the two outboard generator sets and using only the two middle sets accomplish this quiet mode. While all four engines have Christie and Grey resilient mounts, the two inboard engines are also mounted on a 9,275-pound floating deck that is also resiliently mounted. In addition to the Cummins-powered "quiet mode" gensets, the vessel contains extensive hull insulation, dampening tiles and custom built piping isolation hangers have been incorporated to prevent radiated hull noise, and to limit sound pressure levels within the vessel. "This has been my biggest challenge since I worked on submarines," said Dakota Creek Industries' project engineer Elwood Ide, who went on to explain that the resilient mounting and sound dampening systems on the vessel are the commercial equivalent of what is put onto modern submarines. Even the bow thruster is resiliently mounted. Tankage includes 2,320 gallons (8.78 cu. m.) for water, 13,590 gallons (51.44 cu. m.) for fuel, 375 gallons (1,420 liters) for lube oil, 635 gallons (2,366 liters) for dirty oil, 725 gallons (2,744 liters) for oily water, 834 gallons (3,157 liters) for black water and 834 gallons (3,157 liters) for grey water. Aft of the engine room and forward of the Z-drive room is a winch room that will accommodate two winches leaving the main deck clear or with space for containers to be installed. The large wheelhouse includes an aft facing control center, communication console and a desk for research computers in addition to a comprehensive set of navigational aids. Accommodation is provided for 8 to 10 crewmembers, up to 12 live aboard scientists and up to 30-day trip scientists. The vessel is load lined and will carry a stability letter for unrestricted Ocean Service as an oceanographic research vessel. It is being delivered to the east coast by heavy lift ship through the Panama Canal to off load in Florida.

Visit www.maritimeequipment.com/mt & Click No. 31

Chinese Seismic Exploration Require New OBC Vessels



Complete twin-screw medium speed propulsion packages have been ordered from MAN B&W for a twin set of 65 m offshore research vessels. The twins will each be specified and equipped for specific operational tasks, i.e. seismic sourcing and seismic recording. The vessels are designated as an OBC Source Vessel and an OBC (Ocean Bottom Cable) Recorder Vessel, respectively.

The design consulting company for this project is Dalian Shipbuilding Technology Research Center Co. Ltd., located in Dalian, China. Both vessels will be built by Liao Nan Shipyard, also located in Dalian, and the delivery of the first vessel is scheduled to the end of 2006. The operator and owner is BGP/CNPC (China National Petroleum Corporation) and its fleet is mainly based in Tanggu, Tianjin. The operation areas for these two vessels include offshore China and other overseas destinations. MAN B&W Diesel's Four-stroke Propulsion Sales Manager, Jorgen Vinde, said: "Very low levels of vibration and noise from propellers, engines and propulsion systems are key issues for these installations. A very soft resilient seating arrangement of base frame and sandwich mountings has been applied for the dampening of structure-borne vibrations by upwards of 97 percent. Additionally, the ducted propellers have been specially designed and shaped with high priority to low levels of cavitation and noise emission. From an underwater point of view, an absolute decisive factor for the customer is a very silent ship, with minimal noise emission and disturbance in relation to the seismic exploration equipment." The MAN B&W Diesel twin-screw Alpha Propulsion System type 6L23/30A-DVO, which has been specified for the newbuildings, includes:

- Main Engines: Two MAN B&W 6L23/30A-D engines, resiliently seated with baseframe and sandwich mountings. Each develops 960 kW (1305 bhp) at 900 rpm.
- Reduction Gearboxes: Two MAN B&W Alpha AMG8 gearboxes, type 31VO8, with a speed reduction ratio of 900:292.
- Propellers: Two MAN B&W Alpha type VB560 four-bladed controllable pitch propellers. The 1,900 mm diameter CPP systems are complete with tail shafts, intermediate shafts, bearings and stern tube equipment.
- Control System: In addition to the twin main bridge control station, the complete Alphatronic IIA Propulsion Control and Safety System includes a twin engine room control station.

Main Particulars

Length, oa	65.0 m
Length, pp	58.4 m
Breadth	13.8 m
Depth	5.1 m
Draft	3.5 m
Crew	45
Propulsion	MAN B&W Diesel

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Underwater Intervention 2006

January 24-26, 2006

Tampa Convention Center

Tampa, Florida

Originally scheduled for January 30-February 1 in New Orleans, Underwater Intervention 2006 has been moved back a week and relocated to Tampa, Florida. In the months following hurricanes Katrina and Rita, the city received multiple reservations for conventions and meetings forced to relocate from New Orleans.

Scheduled for January 24-26, the exhibits and Technical Program will be staged at the Tampa Convention Center. Headquarter Hotel is the Hyatt Regency Tampa with the Sheraton Tampa Riverwalk Hotel as another conference hotel. Both properties are offering preferred rates to Underwater Intervention attendees, exhibitors, and presenters.

Underwater Intervention 2006 will feature exhibits and information about Commercial Diving, ROVs, AUVs, Oil and Gas, Marine Construction, Shipwreck Exploration and Salvage, Submarine Cable, Communications, Bridges and Dams, Nuclear and Hydro Energy, Ocean Mining, Oceanography and Marine Technology.

This year, the usual tutorials will take place the three days the exhibits are open instead of the day before. The technical program includes a dedicated shipwreck track organized by Gregg Stemm and his crew, and the submersibles program from 2005 will return under the leadership of Will Kohnen. Kongsberg Maritime and C. A.

Information & Schedule of Events

Monday, January 23

Exhibitors move-in	10 am - 6 pm	TCC East Hall
Registration Open	7 am - 7 pm	TCC Registration Level
ADCI Chapter Meetings	2 pm - 4 pm	TCC Meeting Rooms
Early Bird Reception	6 pm - 8 pm	Tampa Convention Center

Tuesday, January 24 - SHOW OPENS

Registration Open	7 am - 5 pm	TCC Registration Level
UI Awards Breakfast	8 am - 10 am	Tampa Convention Center
Technical Sessions	8 am - 5 pm	TCC Meeting Rooms
Exhibits Open	10 am - 5 pm	TCC East Hall
Job Fair	10 am - 5 pm	TCC East Hall

Wednesday, January 25 - Show Day 2

Registration	7 am - 5 pm	TCC Registration Level
Speaker Breakfast	7 am - 8 am	TCC Meeting Room
Technical Sessions	8 am - 5 pm	TCC Meeting Rooms
Exhibits	9 am - 5 pm	TCC East Hall
Job Fair	9 am - 5 pm	TCC East Hall
ADCI Annual General Membership Meeting	5 pm - 6 pm	TCC Meeting Room
ADCI BOD Meeting	After Member Mtg.	TCC Meeting Room
An Evening at the Tampa Aquarium	6 pm - 10 pm	Tampa Aquarium

Thursday, January 26 - Show Day 3

Registration	7 am - noon	TCC Registration Level
Speaker Breakfast	7 am - 8 am	TCC Meeting Room
Technical Sessions	8 am - 5 pm	TCC Meeting Rooms
Exhibits	9 am - 3 pm	TCC East Hall
Job Fair	9 am - 3 pm	TCC East Hall
Exhibitors Move Out	3 pm - 10 pm	TCC East Hall

Tampa Convention Center
333 S. Franklin Street, Tampa, Fla. 33602, tel: 813-274-8511
Hyatt Regency Tampa - Headquarters Hotel
Two Tampa City Center, Tampa, Fla. 33602, tel: 813-225-1234

Richards are sponsoring tutorials: The Sonar Tutorial, led by Mark Atherton, and The Acoustics Tutorial, led by Ian Florence. Dave Kaplan of Steffen, Inc. will host his Hydraulics Tools Workshop, also as part of the technical program.

The following presenters have made commitments to participate in the technical program:

- Nick Lawson, Perry Slingsby
- Junichiro Tahara, JAMSTEC
- Steve Schmidt, Naval Historical Center
- Rogelio Morales, Central University of Venezuela
- Brian Sayrs, Perry Slingsby
- Justin Manley, NOAA
- Akihisa Ishikawa, Nippon Marine Enterprises, Ltd.
- Gina Doyle, Memorial University of Newfoundland
- John R. Smith, University of Hawaii
- Jill Zande, MATE Center
- Ian Florence, Kongsberg Maritime, LTD
- Raj Pandian, Tulane University
- Tarek Elsayed, Arab Academy for Science and Technology
- Gerold Wefer and Tim Freudenthal, University of Bremen, Germany
- Eddie Grant, Cutting Underwater Technology
- Therese Schneck, International Ordovician and Petroleum Services
- Mark Gleason, PhD Candidate, Michigan Technological University
- Dave Epps and Dave Dupont, Perry Slingsby
- Jerry Bohlander and Dana Lynn, Naval Surface Warfare Center
- LCDR Jim Elliot, United States Coast Guard
- Rick Lesser, Lesser and Associates

Special events for 2006 include an early bird reception for attendees and exhibitors; job fair for commercial divers and ROV pilot/technicians, and the student technology fair. The early bird reception will feature great food, and all the special events have the potential to provide networking opportunities. Additionally, the UI committee will host an awards breakfast and plenary session with a keynote speaker for the opening day of the show. At the breakfast, ADCI will present its Commercial Diving Hall of Fame inductees, and other traditional awards and scholarships. The MTS ROV committee will present its Chairman's Award, scholarships, and other traditional awards.

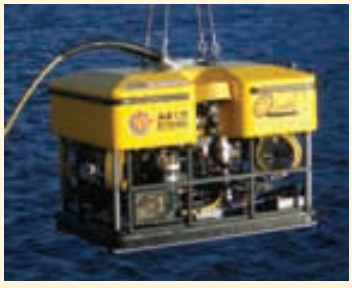
Things to Look for @ UI 2006

Hybrid High Voltage Electro-Optical Connector

Birns developed a Class A Hybrid high voltage electro-optical connector, as part of its BIRNS Millennium Series 3T size. This configuration has two multimode optical fibers, eight 2.5Kv conductors, and four 600v conductors; other configurations are available. The Birns Hybrid can carry high voltages (e.g. to power the sensor package), thus, a single connector can provide high-voltage power to the device, and also carry sensor signals back. Users will benefit from high data rates -- and the reduction in cost and system complexity that results from using a single cable/connector.

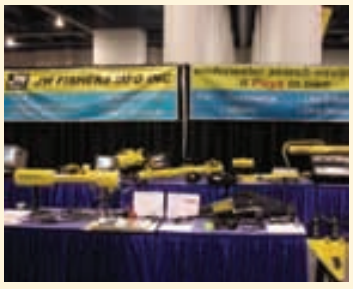
Visit www.maritimeequipment.com/mt & Click No. 1

Curvetech ROV



SMD Hydrovision (SMDH), an independent WROV/Trencher manufacturer, will be exhibiting the latest Curvetech ROV components at UI 2006. In addition to thrusters, intelligent valvepacks and ROV control demos, the company will be displaying footage of the new QUANTUM heavy construction WROV and QUARK ultra compact WROV.

Visit www.maritimeequipment.com/mt & Click No. 2



SCAN-650 Scanning Sonar

JW Fishers specializes in the design and manufacture of underwater search equipment. Their product line includes underwater metal detectors, video systems, lights, magnetometers, sonars, ROVs, cable trackers, and pingers. The newest addition to the line is the SCAN-650, a high resolution, low cost scanning sonar, which will be on display at UI.

Visit www.maritimeequipment.com/mt & Click No. 3

LBV ROV Line

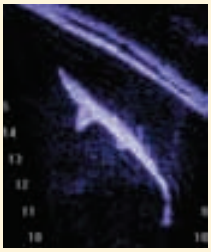
SeaBotix Inc. presents the LBV small ROV product line. There are five primary categories: LBV1502, LBV3002, LBV6002, LBV15002 and "Fly Outs." The number designates the LBV's depth rating in meters and the "Fly Out" category offers three systems in the deeper depth ratings. Standard features include thrusters, small diameter umbilical, two forward cameras, lamp tracking camera, lateral thruster, auto depth/heading, and video overlay, with other optional features.

Visit www.maritimeequipment.com/mt & Click No. 4

TITAN RigMaster2 Upgrade

Kits are available to upgrade RigMaster grabber arms to the specifications of the recently released RigMaster 2. With side plates that are approximately twice as thick as the previous RigMaster configurations, the RigMaster 2 is designed for ruggedness and durability. The kit can be used to upgrade any RigMaster grabber arm.

Visit www.maritimeequipment.com/mt & Click No. 5



Dual-Frequency Identification Sonar

DIDSON (Dual-Frequency Identification Sonar) gives near video-quality images for inspection and identification of objects in turbid or

Things to Look for @ UI 2006

dark water where optical systems are ineffective. DIDSON is small, can be mounted or hand-held, and operates up to depths of 3000 meters.

Visit www.maritimeequipment.com/mt & Click No. 12

Broadband Acoustic Spread Spectrum Technology

LinkQuest Inc., manufacturer of underwater acoustic positioning and communication systems, presents the Broadband Acoustic Spread Spectrum Technology. Additionally, LinkQuest's TrackLink USBL systems, PinPoint LBL systems and high speed underwater acoustic modems will be on display at Underwater Intervention 2006.

Visit www.maritimeequipment.com/mt & Click No. 6

Carrillo Underwater Systems Squawk Box Classic

This unit supports the necessary communication functions for any dive station, made of mahogany and featuring a full 15 watts of audio power. Features include: Two wire push to talk and four wire open mic configurations; Multiple diver use; Large 10-watt inverted cone two-way speaker; Improved low hum, no pop, 15 watt, high efficiency CUS audio amplifier.

Visit www.maritimeequipment.com/mt & Click No. 7

SHARPS: Sonic High Accuracy Ranging and Positioning System

The newest addition to Marine Sonics Technology's product line is SHARPS (Sonic High Accuracy Ranging and Positioning System), a high accuracy underwater positioning system. SHARPS is designed to utilize spread spectrum signal processing to improve timing resolution, range performance and noise rejection.

Visit www.maritimeequipment.com/mt & Click No. 8

New ROVer Miniature Color Camera

Remote Ocean Systems will showcase a new ROVer miniature color camera, high-intensity LED Smartlight, and RS-485 controlled wireless pan and tilt. ROS aims to provide solutions for all your rugged video and lighting requirements.

Visit www.maritimeequipment.com/mt & Click No. 9

Sonar Solutions

BlueView Technologies provides compact sonar solutions for Surface Vessel, ROV, UUV, and diver applications. The ProViewer line of products features breakthrough technology designed to deliver improved performance. Blue View aims to implify missions with streaming imagery to help find targets faster, monitor divers, navigate an ROV and document operations.

Visit www.maritimeequipment.com/mt & Click No. 10

IXSEA

IXSEA specializes in cutting-edge technology and provides navigational, subsea positioning and imagery systems for the marine world.

IXSEA designs, develops and manufactures components and systems for high-tech industries including the defense, civil marine and offshore oil and gas industries.

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UI 2006 Exhibitor List

Company Name	Booth Number
ABTEL and Impulse Enterprise	431
AMRON Intl	139
Anti-Fouling Technologies	443
Aqua-Air	516
Bay-Tech Industries, Inc.	422
Benthos, Inc.	643
Birns, Inc.	120
BlueView Technologies	637
Broco	217
Carderock Div., NAVSEA	425
Cortland Companies	537
CRP Group	631
Cutting Underwater Technology	623
Cygnus Instruments	449
Deep Development Corp. - GSI Division	629
Deep Ocean Engineering	125
Deep Sea Systems	419
DeepSea Power and Light	224
Delta Wave Communications	222
Denso NA	437
Divers Supply, Inc	213
Divex / Seabotix / Analox	525
Dynacon	313
Epic Divers and Contractors	430
Falmat, Inc.	413
Fenstermaker	423
Five Star	356
Five Star Products, Inc.	257
Flange Skillets	140
Florida School of Commercial Diving	146
Focal Technologies	142
FOX INDUSTRIES, INC.	124
G2000SS	548
Geospace Offshore	118
Gulf Engine and Equipment	536
Hardigg Cases	632
Harvey-Lynch, Inc.	547
Historical Diving Society	137
Hylok-MVF Process Controls	514
Innerspace	234
Innovatum, Inc.	522
International Ocean Systems and Underwater Contractor Intl.	619
International Special Risks, Inc.	116
IXSEA	427, 429
J W Fishers Mfg, Inc.	249
Jack Vilas	528
JCM Industries, Inc.	630
John W Fisk Company	620
Kirby Morgan	149
Kongsberg Maritime, Inc.	113
LinkQuest	512
Macartney Offshore, Inc.	132
Marine Advanced Technology Education (MATE) Center	544
Marine Magnetics	331
Marine Sonic Technology	445
Marine Technology Reporter	251
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Nordeutchse Seekabelwerks	613
Nuvair	415
Nuytco	533
Oceaneering International, Inc.	310
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PAC Stainless	618
PREVCO	635
Princetel, Inc.	122
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Promare	621
Remote Ocean Systems	519
Roper Resources	448
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Schilling Sub-Atlantic Alliance	323
Schlefring North America, LLC	530
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SeaEye Marine, Ltd	134
Seatronics Inc	636
Seatronics, Inc.	638
Seimac Limited	518
Shark Marine Technologies Inc.	615, 617
Sidus Solutions	135
SMD Hydrovision	441
Sonardyne	236
Sound Metrics Corporation	328
South Bay Cable	123
Southwest Research Institute	138
SSP Fittings	531
Steffen	248
Subac Underwater Cement	417
SubConn	130
Subsalve	513
Subsea Technologies, Inc.	129
Sun-Star Electric	128
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TAMMS	136
Trelleborg	543
Undersea Breathing Systems	148
Video Ray	223
Water Weights	435
Watershed ZipDry Waterproof Bags	349

Dr. Robert Ballard's Archaeological Oceanography Program

Evolution at URI

by Greg Trauthwein

ex·plor·er

Pronunciation: ik-'splOr-&r, -'splor-

1 : one that explores; especially : a person who travels in search of geographical or scientific information

Finding the word "explorer" takes but a few seconds using Merriam-Webster Online, garnering the definition above. MTR recently chose a more laborious means to discover a truer, more animated meaning of the noun, driving three and half hours north of New York City to the University of Rhode Island Graduate School of Oceanography on the Narragansett Bay Campus to meet with world-famous explorer Dr. Robert Ballard.

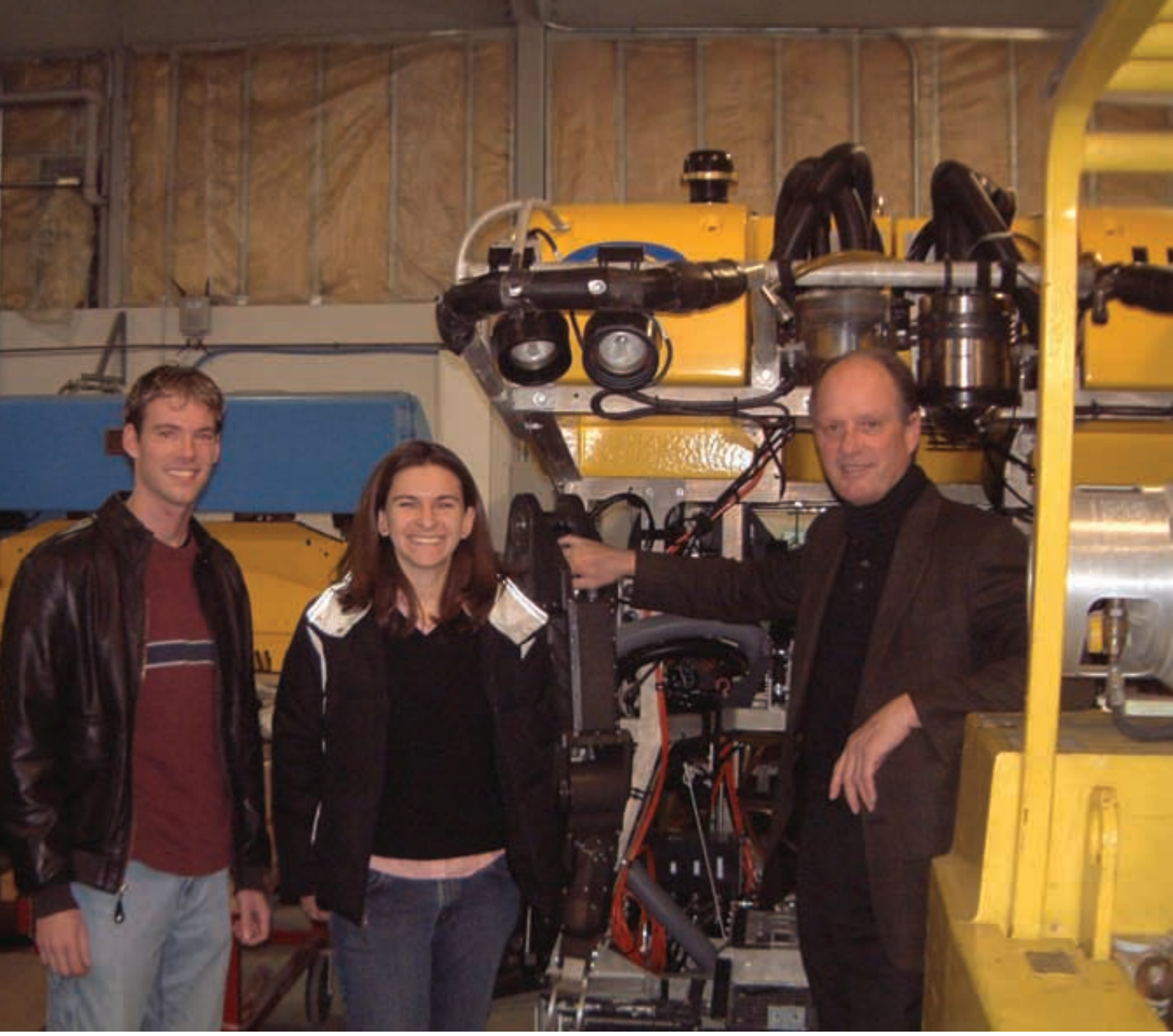
Most every biographical resource on Dr. Robert Ballard includes "discovery of the RMS Titanic" in the first line. Though significant in historical importance and astounding given the level of technical expertise required to locate and explore the famous wreck, Dr. Ballard's missions to Titanic represent just two of 120 expeditions in his career. Even more colossal than this one epic discovery is Dr. Ballard's commitment to evolving the science and business of undersea exploration.

"My strong card is the technology of deep submergence science and technology, and I'm taking that expertise and using it as broadly as possible," Dr. Ballard said.

His efforts to advancing deepsea exploration and discovery have manifested most recently in a new Archaeological Oceanography doctorate program at URI's Graduate School of Oceanography. Coupled with this is the development of the "Inner Space Center" at URI, a high-tech program designed to give access to undersea science to a much broader group of students and scientists via 'telepresence' technology, as well as his continued work with the JASON Project, a project he founded in 1989 as a nonprofit educational organization to "inspire in students a life-long passion for learning in science, math, and technology through hands-on, real-world scientific discovery."

A Multidisciplinary Approach

At the age of 63, Dr. Ballard's attention is squarely focused on evolving the science of deepwater exploration, and given his educational background and long list of career successes, he seems uniquely outfitted in this regard. While the study of undersea structures and life has advanced exponentially and in tandem with technology over the last 40 years, it is evident that discovery of the wonders lying deep beneath the waves is still in its infan-



Dr. Robert Ballard, far left, is spearheading an innovative doctorate program in Archaeological Oceanography at the University of Rhode Island. Pictured with Dr. Ballard are two of the program's students, Mike Brennan and Katy Croft.
(Photo: Greg Trauthwein)

cy, particularly once it's realized that Dr. Ballard's generation was the first to offer a doctorate in oceanography.

Work to establish the Archeological Oceanography doctorate program at URI was launched nearly four years ago, but this, too, is still in its infancy, as the program to date has six students and two tenure track faculty positions, with a third — on Coastal Anthropology —pending. The numbers simply cannot paint an accurate picture, though, as the undertaking at URI is truly unique.

The premise of the program is to bring together three distinct disciplines: Social Sciences; Oceanography; and Engineering, under the same roof. "The idea is to bring social sciences into our world," Dr. Ballard said. "You cannot be an archeologist in the deep sea unless you are an oceanographer."

"My grandmother used to say 'Great is the person who plants the tree knowing they will never sit in its shade' … that's what I'm doing: planting trees," Dr. Ballard said.

The hypothetical seeds in this regard are the students enrolled in URI Archeological Oceanography doctorate program, a veritable "Top Gun" of bright minds. "These are unique individuals with a duality of specialties," Dr. Ballard noted. In selecting the individuals who will be ordained to carry the torch of the proposed legacy, Dr. Ballard seeks a unique group of elite students, each with a diverse educational background. Two good examples are Katy Croff and Mike Brennan. (See related stories, page 26)

"We're trying to mainstream, so that when my students get their doctorates they can write a proposal that will be recognized," Dr. Ballard said.

"My grandmother used to say 'Great is the person who plants the tree knowing they will never sit in its shade' ... that's what I'm doing: planting trees" Dr. Robert Ballard

Inner Space System

While the romantic vision of a deep sea explorer is that of spending many weeks at sea, deploying state-of-the-art technology, embarking on potentially perilous missions while amassing data and returning to the shore to study data and publish results, Dr. Ballard insists that the future of deep sea study depends on the ability to broaden the access of gathered information as wide and far as possible, inspiring a life-long passion in younger students to explore.

In reality, the oceanographic community is a rather exclusive group, as competition for technological resources and bunks aboard research ships is fierce.

"Most people can't get to sea; we are constantly fighting over bunks," said Dr. Ballard. "The Inner Space System is the equalizer. I'm much more interested about what's down there than about the tools that get me down there," said Dr. Ballard. "Our job is to discover. Period. This is a more efficient way to spend the tax payer's dollars and discover."

The Inner Space Center was funded by the citizens of Rhode Island in a 2004 State $14 million Bond referendum, and the technology was funded in part through a grant from NOAA Office of Ocean Exploration through

URI research vessel Endeavor. **(Photo: Greg Trauthwein)**

Shore-based command/control center within the URI Inner Space Center linked to the ship in real time.

the Institute for Exploration in Mystic, Conn., and The Champlin Foundations. (NOTE: The Inner Space Center and its role in connection with NOAA's exploration vessel Okeanos Explorer, introducing new exploratory paradigm based upon "tele-presence" technology, is the subject a feature article written by Dr. Robert Ballard, Dr. Steve Hammond, and Dr. Larry Mayer, to be published in the March 2006 edition of Marine Technology Reporter.)

The Okeanos will carry a broad range of oceanographic sensors including a hull mounted multi-beam sonar and other sensors under development, but at the heart of the sensor suite aboard Okeanos Explorer is a family of deep submergence vehicle systems including towed sonar, imaging, remotely operated, and autonomous vehicles. Data generated from this array of sensors will flow into the ship's command control center, displayed on banks of high definition plasma and CRT screens for use by the exploration team. The displays on the command/control console at which the watch leader aboard the Okeanos sits will be transmitted in real time via satellite to an identical command/control console within the URI Inner Space Center, operated by members of the team of engineers and technicians that rotates on a regular schedule between the Okeanos and the Inner Space Center.

From the Inner Space Center, the same data stream will follow via Internet2 to a host of sites across the country. Here the multi-disciplinary team monitoring the exploration mission will be able to go should a discovery be made that needs their expertise to exploit any discoveries. All of the consoles will have 16-channels of two-way communications so that the personnel involved at that moment in the operations aboard ship and ashore can

freely discussion what actions need to be taken. An expert at a participating University, for example, can take over the role of shipboard watch leader in real-time directing that team as it carries out critical follow-up observations; talking directly into the ear of the ROV pilot as both look at the same high definition images coming up from below as well as seeking advise from colleagues working at other remote consoles, displayed on banks of high definition plasma and CRT screens.

"The huge advantage of the system is being able to call in experts for data interpretation," Dr. Ballard said. "It is a wonderful teach tool, as it can motivate and educate." Armed with bright minds and the latest technology, the explorer's mission will continue for generations to come.

URI Institute for Archeological Oceanography Students Shine

By Maggie L. Merrill

The new program at URI has attracted six doctoral candidates. During our recent visit, we were fortunate to meet two stellar students who took time out of their busy and very important finals studying to talk to us.

Katherine Croff

KT Croff is one of six PhD candidates in the URI Institute for Archeological Oceanography . She comes to the program with a high school diploma from the Academy of Our Lady of Peace in San Diego. KT graduated from the Massachusetts Institute of Technology with a Bachelors of Science in Ocean Engineering and Masters of Science in Maritime Archaeology from the University of Southampton (UK). She is the founding president of the MIT student chapter of MTS and she and her young and very bright colleagues hosted two ocean technology job fairs on the MIT campus. During the past eight years Katy and been extremely active in various professional societies; Marine Technology Society; IEEE OES, SNAME, ASNE, and AIA (Archaeological Institute of America). In 2001 she was awarded a fellowship in NOAA's John A. Knauss Marine Policy Fellowship Program where she did worked in the Office of Ocean Exploration during its inaugural year. At OE, she was deeply involved with all aspects of the new office, from expedition coordination and fieldwork to the development of office policy and strategic planning.

In her research at URI/IAO Croff will investigate geological changes and their impacts on archaeological site distribution and preservation in the international waters of the Sea of Crete. This work will begin in 2006 with a geophysical survey using multibeam bathymetry, side scan sonar, seismic profiling, core sampling and initial target identification with ROVs. In future years the survey area will be expanded geographically and will also intensify both geological and archaeological investigation in certain areas of interest, based on data that will be collected and

Mike Brennan and Katy Croff in the portable command center.

(Photo: Greg Trauthwein)

analyzed in the coming months.

They will work with Greek colleagues in both the oceanographic and archaeological communities on this project.

Mike Brennan

Another student we were fortunate to meet during our visit to the bustling IAO facility was Mike Brennan. Mike graduated from Avon High school in Avon, Connecticut. Last spring he graduated from Bowdoin College in Maine with majors in Geology and Archaeology.

Mike first worked with Dr. Ballard when he was in 9th grade as an Argonaut on the JASON VIII expedition to Yellowstone National Park. Mike and Ballard have corresponded since that time and upon his college graduation, Ballard asked Mike to apply to the new program. Brennan current work is in the Black Sea and he will be using geology, oceanography, and archaeology to locate and identify archaeological sites, which will help describe the activities of the ancient mariners and the societies that lived along the shore of the Black Sea.

Both Brennan and Croff estimate the program will take 3-5 years to complete This is not a program for someone on the fast track. Both students are preparing for a Mediterranean cruise aboard URI's own RV Endeavor during the next 6 months, as well as the RV Aegaeo, an oceanographic research vessel operated by the Hellenic Centre for Marine Research.

The mission is to conduct a geophysical survey with the Aegaeo and then to use the Endeavor to deploy the Hercules, Argus and Echo vehicles and their handling systems.

They will conduct seismic surveys of the Sea of Crete and identify interesting bottom features that will be investigated further. They are looking for shipwrecks and other archaeological sites as a way to understand trade routes and society as a whole. In addition they are seeking to map any geological changes that may have occurred to alter the depths of the water and change the character of the ocean going trade routes used in ancient civilization.

According to Dr. Rod Mather, Associate Professor of Maritime History and Underwater Archeology working with Ballard and crew, "by mapping submerged landscapes and identifying ancient shipwrecks we can learn much about ancient trade routes, cultural contacts, and shipbuilding technology.

Ultimately, underwater archaeological surveys of the Mediterranean may help rewrite the history of the ancient world."

The JASON Project

The JASON Project, founded in 1989 by Dr. Robert D. Ballard, is a 501(c)3 nonprofit educational organization headquartered in Ashburn, Va. Its mission is to inspire in students a life-long passion for learning in science, math, and technology through hands-on, real-world scientific discovery. The JASON Project was named in the spirit of the Greek myth of Jason and the Argonauts. Long ago, in ancient Greece, a young man named Jason set out on an incredible nautical expedition in the company of a heroic band of explorers. Varying accounts of Jason's adventures have been recorded. But his story begins in the Kingdom of Iolcus. Not long before Jason was born, a greedy uncle named Pelias seized the throne from Jason's father, throwing the good king in jail. When the king's wife gave birth to Jason - the rightful heir to the throne - she worried that Pelias might kill him and decided to hide the baby. Pretending that Jason had died, she sent him far from Iolcus to live with a loyal centaur named Chiron. Chiron cared for and tutored Jason, who grew strong and smart. And when he was full grown, Jason went back to Iolcus to confront his uncle.

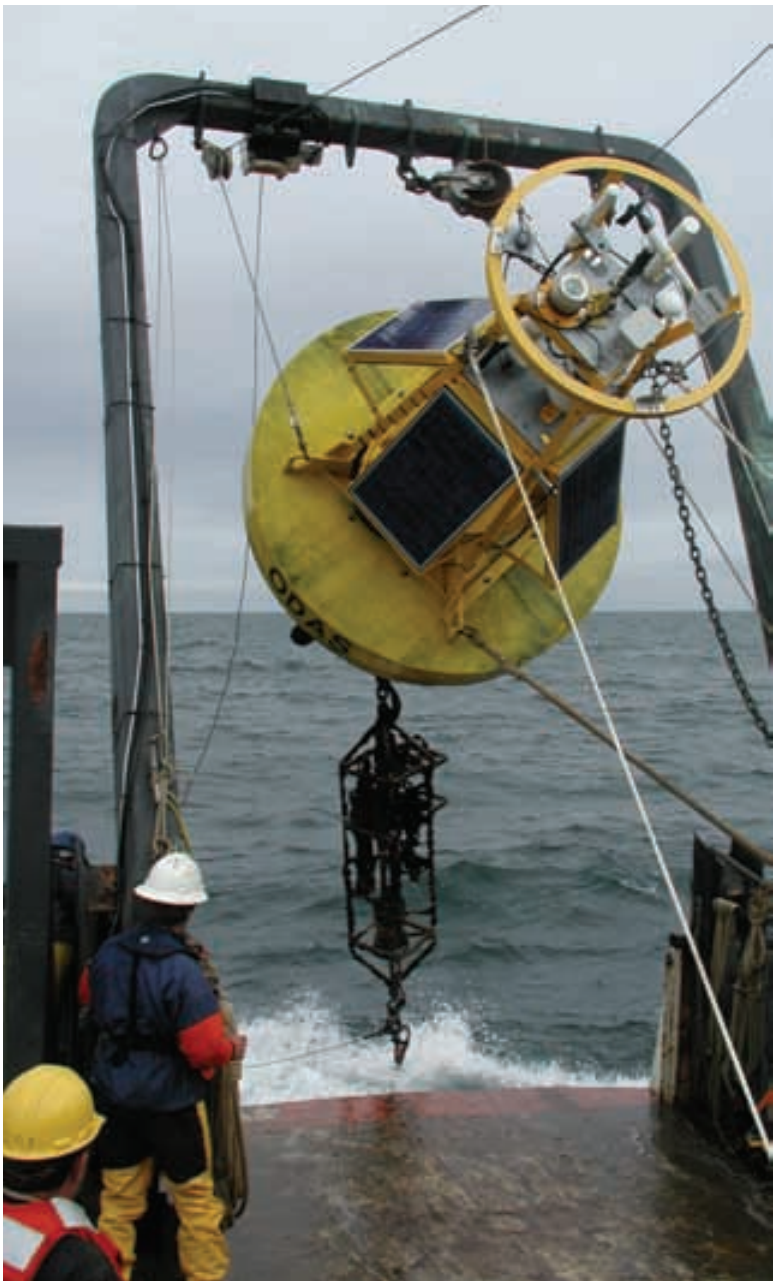
To Jason's surprise, Uncle Pelias agreed to give up the kingdom if Jason would do just one little thing: capture a golden fleece - the skin of a magical ram - from the Kingdom of Colchis, a land at the very farthest reaches of the known world. Impossible? Maybe. But buoyed by youthful confidence and the spirit of adventure, Jason accepted the challenge. For though Pelias was sure that Jason would never return to Iolcus alive, Jason knew that with perseverance, a team of talented helpers, the best tools and equipment, and a bit of good fortune (or help from some friendly Greek gods), the impossible might just be possible. So Jason sent out a call to anyone game for adventure, and the bravest and most talented men and women in all of Greece - including the strong man Hercules - answered his call. Together they sailed off in a mighty ship called the Argo, the biggest and best boat the Greeks had ever sailed. The crew members were called Argonauts, in honor of the boat, and after many adventures and all-but-impossible feats, they did indeed capture the golden fleece and return to Iolcus to free Jason's father - and to tell tales of a world beyond Greece that few had dared to explore.

(Source: www.jasonproject.org)

Changing of the Buoys

A GoM Adventure

by Maggie L. Merrill



On a chilly day in early October, MTR's Maggie Merrill battled torrential rain and monumental traffic to join the University of Maine buoy operations crew in Castine Maine, headquarters to Maine Maritime Academy. With the Academy students all nestled in their beds, lines were cast off and the RV Argo Maine made way to Rockland Harbor, to pick up the rest of the crew. The mission of this one-day trip was to replace one of the 10 buoys in the Gulf of Maine Ocean Observation System (GoMOOS). Mooring "E" Central Maine Shelf is located 1.5 miles south of Monhegan Island, Maine. After a two-hour ride to the buoy that was on station, the professional crew maneuvered the boat in steep, choppy seas and 25 knot winds to bring the yellow behemoth onboard. It was too rough to work on deck, so the boat ducked under the lee of Monhegan Island where the water was flat and there was little breeze. The crew set to work for the next four hours removing the heavily encrusted instrument packages from the buoy that had been deployed since April 2005. On deck was a newly constructed set of instruments that were readied for the switch. The new instruments had to be calibrated using a link to the web via a satellite phone. The buoy was officially off-line for five hours that day. Once the instruments checked out, the electronics were loaded inside cylinders, sealed and the entire buoy along with a huge mooring, 300 ft. of chain and cable was carefully dropped over the stern to collect

IOS instrument package appears in tact, albeit encrusted on E buoy after a six month deployment.

data for the next six months.

Buoy E is located in a transition region between the Eastern and Western branches of the Gulf of Maine Coastal Current system. This location serves as an important sentinel for detecting the degree of through-flow from the eastern Maine shelf to the western Maine shelf.

This buoy is one of ten oceanographic buoys that make up the Gulf of Maine Ocean Observation System (GOMOOS). The buoys are replaced every six months in October and in April. This is the fifth season of operations for the system. The buoys are strategically placed throughout the region to provide a wide array of weather and oceanographic data. Each buoy has standard weather monitoring sensors for wind speed and direction; air and water temperature; wave height and period, and visibility. They differ in what is deployed underwater and that depends on what the scientific mission is for each buoy. However, all buoys measure surface currents and temperature a several depths. The RV Argo Maine left the dock in Castine with one completely refurbished buoy instrumented exactly like the buoy it would replace later in the day. Owned by Captain Randy Flood, Lance Burton, and Don Bradford, the Argo Maine is equipped with a huge crane for lifting the buoys, a winch handling system that feeds

Refurbished replacement buoy for "E" on deck of RV Argo Maine in Castine, Maine.

Neal Pettigrew and crew service all GoMOOS buoys in the operations facility at UMaine in Orono.

below, taking up less deck space and a roomy lab for scientists to set up experiments. The RV Argo Maine is the principal vessel used by the University of Maine to service the 10 buoys twice a year and to provide emergency repairs in cases of sensor failure, loss of telemetry, or when the buoys go out of service in case of collision or severing of the moorings.

In the case of "E" there is an array of underwater sensors attached below the buoy to measure water temperature at 1, 2, 20 and 50 m; chlorophyll concentration at 3 and 18 meters; current speed and direction at four meter intervals from 2-98 meters; Light sensors at 0, 3 and 18 meters; water density/salinity at 1,20 and 50 meters; as well as wave height and wave period, wind speed and direction, percent clear sky.

The Gulf of Maine, GOM, not to be confused with the Gulf of Mexico, is the body of water located from Cape Anne, Massachusetts to the southern tip of Nova Scotia. This body of water is home to over 52 species of commercially harvested fish. Scientists are utilizing some of the GoMOOS data to figure out what the affect of over fishing, natural migration and water and climate conditions may have on these fish stocks. There have been correlations made between the changes in the surface water temperature and currents and the transport of lobster larvae and ultimately on the lobster landings along the coast of Maine. University of Maine Professor, Dr. Neal Pettigrew was the champion, if you will of the real-time GoMOOS buoy array system. The buoys are designed, assembled, and maintained by the technicians and engineers in his research group in Orono. Dr. Pettigrew's research focuses on the circulation of the gulf, and the impact of that circulation on transport of red tide, larvae, nutrients, and pollutants. Specifically he has been track-

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ing the variable relationship between the waters of GOM and the North Atlantic as they meet and exchange through the Northeast Channel, which lies between Georges Bank and Nova Scotia. The GoMOOS buoy network is not only a data acquisition and delivery system it is also a non-profit organization located in Portland Maine. This corporation has a board of directors drawn from member institutions including members from marine transportation and fishing industries, as well as research and academia. They meet regularly to ensure the validity of data and usefulness to users in the region. The science and technical program is overseen by chief scientist, Dr. Pettigrew who coordinates a consortium of scientists from the University of Maine, University of New Hampshire, Bigelow Laboratory for Ocean Sciences, the Woods Hole Oceanographic Institution, and Bedford Institute of Oceanography. GoMOOS is the working prototype for a regional ocean observing system. GoMOOS serves the regional states and provinces that border the Gulf of Maine. The entire GOMOOS network is being used by commercial mariners who seek up to date info on sea conditions, wind direction and currents. NOAA weather radio uses the info in their buoy reports. Scientists are using the buoys to understand basic ocean processes. Educators are using the buoys and the web site to help students understand the importance of the ocean on weather and economics. USCG search and rescue and other emergency responders use the data from the buoys to assist in their operations. Public health officials are using the hourly data from the buoys to monitor water quality for shellfish operations and swimmers. Yachtsmen, kayakers and fishermen used the buoy information to plan their trips along the coast. Surfers use the info to determine which beaches will have the best surf. The web site is user-friendly; constantly updated and used by many for up to date marine information to enable them to make operational decisions. Hourly buoy updates are available via the web site and via the "dial-a-buoy" tool which enables people without access to the web to use the information.

RV Argo Maine.

Staff scientist, Dan Abraham, is servicing the IOP package pictured on deck. He works for Dr. Collin Roesler, Sr. Research Scientist at Bigelow Laboratory for Ocean Science in Booth Bay Harbor, Maine. She is a bio-optical oceanographer who specializes in the development of remote and in-situ optical methods to determine distribution, composition and productivity in both marine and aquatic systems.

The buoy hardware development, operations, and maintenance of the GoMOOS system was initially funded by the Office of Naval Research, but for the last several years has been funded by congressional earmarks through NOAA. . This funding mechanism is a stop-gap to the funding of the national program. The vagaries of ear-mark funding have resulted in a decrease of 75% in the GoMOOS budget for next year. Plans are hastily being made to arrange for alternative sources of funds to make up the shortfall. At present, the University of New Hampshire and the University of Maine have both agreed to partially fund the observing system. The state of Maine has also been approached. The infrastructure for transmitting the hourly data-casts is being provided by the University of Maine's Physical Oceanography Group. The hourly data is made available 24/7 at www.gomoos.org or via touch tone phone or cell through the National Data Buoy Center "dial-a-buoy" service.

Profile:

University of Maine: The School of Marine Sciences

The School of Marine Sciences is a Center of Excellence for Marine Education, Basic and Applied Research, and Public Service.

The department was formed in 1996. Currently there are 38 core faculty members and 22 cooperating faculty. As of May 2005 there were 114 Undergraduate Majors and 63 Graduate Students in Oceanography, Marine Biology and Marine Policy.

Research activities encompass topics in aquaculture, marine biology, marine biotechnology, oceanography, marine geology, public policy and marine archeology. Although there is a concentration of topics directed toward understanding the water systems right off the Maine coast, there are many researchers working on issues all over the globe.

There are several programs underway which address currents, plankton distribution and densities, light transmission, Red Tide, water temperature and affects on commercial fisheries in the Gulf of Maine (GOM). Remote sensing, Iron fertilization, tropical fish aquaculture, sea weed propagation, ground fish management, beach water quality monitoring; oyster, salmon, halibut, cod, bait worm aquaculture are also being addressed at both on the main campus in Orono and at one of the field research installations along the Maine coast.

The Darling Marine Center, located about an hour from the Orono campus, is a fully equipped, world class coastal research facility with laboratories, various boats for collecting samples, dorms for housing visiting professors and students and conference facilities.

This ample and very beautiful campus houses the Semester-by-the Sea program for undergraduates enrolled in the marine science program.

UMAINE researchers collaborate with colleagues all over the globe and throughout the United States, making it a world renowned center for marine research.

— Maggie L. Merrill

For more information on the UMAINE School for Marine Sciences contact:
tel: 207.581.4381
or visit them on the web at
www.marine.maine.edu

Industry Discusses Port Threats

IEEE Ocean Engineering Society Homeland Security Technology Workshop; Ocean and Maritime Technologies for Infrastructure Protection December 6-8, 2005, Newport, Rhode Island

By Maggie L. Merrill

Keeping up with what's new in the maritime security field is no easy task. Ever since September 11, 2001, all in the marine field have been put on the hot seat. The job is to figure out how to protect U.S. ports and harbors from terrorist attacks. Fortunately the U.S. Coast Guard is assigned to lead the effort to provide protection of our ports and they are doing a Herculean job. There are 361 ports that must be assessed for threats and then prioritized in terms of how much and how quickly they will be protected and with what. There is much head scratching and maneuvering on the part of legislators, industry officials, the U.S. Navy, the USCG, port authorities, local police and fire departments as to what procedures and protocols should be established. The USCG is doing its best to coordinate the efforts off all concerns.

According to Rear Admiral Joseph Nimmich, USCG, one of the panelists at the December 6-8 Conference, "Once you've seen one port, you've seen one port," which means each of the ports with the highest priority in the U.S. must have separate security plans that are customized to address specific threats in those ports. Nimmich went on to say that one of his biggest worries is the threat of attack on LNG tankers, cruise ships, power plants, bridges to name of few from small, rogue pleasure boats. It's one thing to track all commercial ships traveling along the coast, but how do we track and monitor all the pleasure craft? It may be impossible. Dec. 7 was the anniversary of the biggest maritime awareness failure in the U.S. history, which was the surprise attack on Pearl Harbor when 2,800 service men and civilians were killed. Today we are not that must better equipped to prevent our commercial ports from being attacked.

So much of protecting the ports in the U.S. is complicated by all the interests involved and what the limits are of their jurisdictions. The USCG has been extremely successful at bringing all the parties together including: shippers, port authorities, cruise ship owners, local police and fire to agree on procedures, priorities and protocols. As a result, five years after Sept. 11, detailed port protection implementation plans are in place for at least 66 of the top ports. Dr. Gary Salisbury of defense giant, Northrop Grummen Corporation, discussed actions that can be taken to create an overview of the U.S. coast and integrate many data sources to provide a snap shot of potential threats. He and others believe that it is possible to apply the domain awareness models developed for U.S. military operations offshore to the domestic arena. "The technology and intellectual property to do this is available, but specific priority setting and funding are the hitch." He

L-R Tim Howard and Jake Ferreira -USCG, Pamela Hurst-conference co-chair - Lockheed Martin; Rear Admiral Pekoske-United States Coast Guard, Boston Station; Bruce Winterstone - Lockheed Martin.

said that there will be challenges in working with industry and other government entities to develop better partnerships. There are many complications when it comes to sharing certain types of information and in the procurement of products and services. In the shipping business, for example, ship captains are being asked to report when they leave a port and where and when their next port of call will be. This information is posted on a web site. Companies are reluctant to make this information publicly available as it is highly competitive in nature. They have no issue making the information available to authorities, however. Rear Admiral David Pekoske, Commander of the 1st Coast Guard District, New York to Maine, said that the Coast Guard works jointly with all parties when it comes to providing port security; it's a necessity based on the limited resources within the Guard. An area of new technology and capabilities development is being able to detect and track targets out to 200 miles. Deepwater security is huge undertaking and one of the USCG's major priorities. The USCG R and D center in Groton has been evaluating technologies for developing underwater detection and security systems. Some of the technologies featured at the conference included a forward seeking sonar device manufactured by FarSounder, Inc., that is being evaluated by the USCG and the US Navy for use as a swimmer detection device. Researchers from Applied Physical Science Corporation presented data on the usefulness of an underwater loud hailer that would be used when a swimmer approached a target.

NUWC had a Spartan Umanned Surface Vehicle set out in the parking lot. It's a remotely operated go-fast inflatable that can monitor and attack threats. It can be preprogrammed or directed real time via and RF link.

Several underwater vehicles were showcased for use in providing remote threat assessment operations. Some of those on site included Sippican's EMAT, Mark II Submarine Training Target; the Gavia AUV, a Hydroid REMUS AUV, and the Benthos StingRay ROV.

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Underwater Imaging

Giving up the 'Ghost'

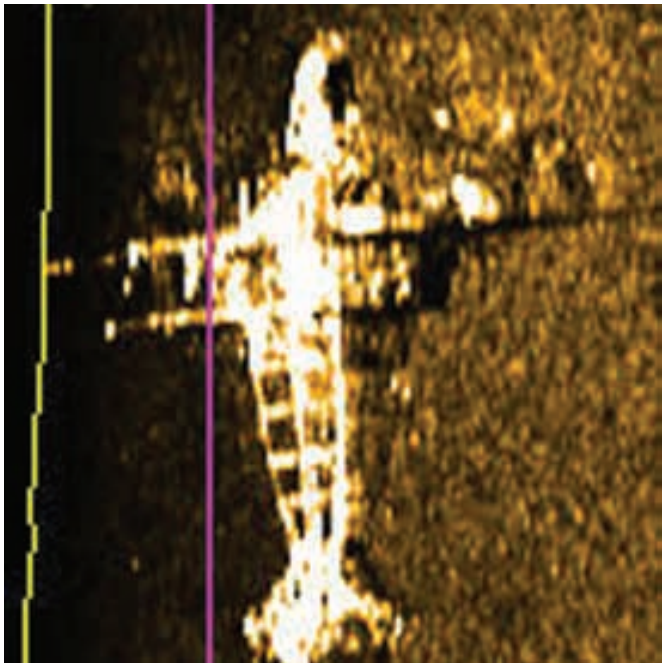
By W. R. (Bil) Thuma, Geophysicist
Plus Ultra, Toronto, Canada

As Canada's northern regions began attracting more attention for its resource potential in the post WW I era, James Richardson saw an opportunity to service this growing market and in 1926, established Canadian Airways Limited that decades later would grow to become one of Canada's national airlines. Robust aircraft, outfitted with skis and floats as well as wheels, were to become the backbone of CAL, bringing supplies, mail and passengers to outposts throughout the north. But in 1926 these were simply open cockpit, fabric-covered, wooden winged Fokkers operating out of Spartan aerodromes that plied the skies, servicing remote native communities and solitary prospectors in search of glory and gold. Canoes and dog sleds were yielding to wings, rotary engines and devil-may-care bush pilots.

In 1928, CAL purchased 12 of 45 Fokker Standard Universals made in New Jersey. One of the remaining 33 was bought for Admiral Byrd's extraordinary expedition to the South Pole. In December 1931 as the more powerful 'Super' model was becoming the plane du jour, 'Standard' G-CAJD flight #313 was making its way north to a gold prospect when weather closed in and forced it to land on a remote lake in Manitoba at the 53° N latitude. Weak ice instantly claimed the aircraft but the pilot and mechanic were able to scramble to safety. After 10 days awaiting rescue, they were found by a native trapper who helped them walk 60 miles to the nearest trading post. Held up by its wings for the winter, the lake finally swallowed the aircraft as the ice broke up in 1932. Fast forward 45 years and G-CAJD became the last known, accessible wreck of this model and type. Rarity had set in. It was this combination of factors that attracted the Western Canada Aviation Museum and prompted several expeditions to determine its location. However, numerous attempts from 1975 to 2002 failed to turn up any sign of the aircraft and the elusive G-CAJD became known as the Ghost of Charron. Enter McQuest Marine Science in 2003 and a more structured, systematic and professional search plan. From that point on, it was only a matter of time and technology as searchers swept nearly 35 sq. km of the lake until either we exorcised the Ghost or determined that nature had wrecked it beyond detectable limits. The answer came on the July 4, 2005 when the L3 Klein System 3000 produced an unmistakable image of the Fokker 40 m off track. Subsequent runs confirmed its

1930s pilot and Fokker.

Side scan sonar image of the Fokker.



condition and that it was sitting intact and proudly on its skis in 120 ft. of water, enticingly close but beyond the 30 m limit for free unsupported diving. Coming to the rescue was the Seabotix model 150 ROV, which confirmed that the Ghost had been found. July 2006 will see a full recovery effort using work ROVs brought in by float plane, the only means of moving man and machinery into this remarkably pristine and uninhabited site. In July, the mission will be carried out and communicated via web cast, as the Fokker is prepared for extraction by ROVs and divers, finally breaching the surface after 73 years and is airlifted off to its new home in Winnipeg.

Fenstermaker Uses Acoustic Imaging Tech in Storm's Wake

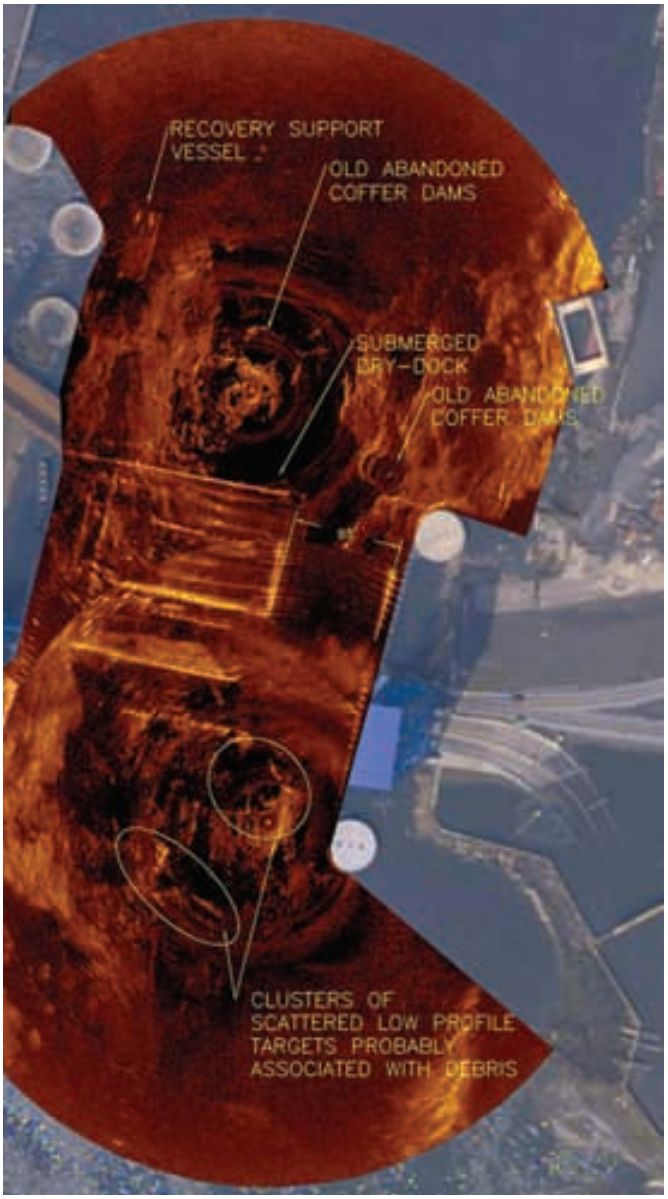
To help locate and resolve post-Katrina hazards lurking beneath the murky waters of the Port of New Orleans' Inner Harbor Navigation Canal, Boh Bros.Construction Co., L.L.C. of New Orleans tapped into some innovative underwater imaging technology via C.H. Fenstermaker & Associates Inc.

"High-definition underwater acoustic visualization is changing the way we see the world," said Ken LaBry, manager of the firm's Acoustic Imaging Group. "We have assembled a team of qualified personnel and given them the best tools possible for performing this work. The imaging services we currently use provide our clients with unparalleled precision in underwater applications."

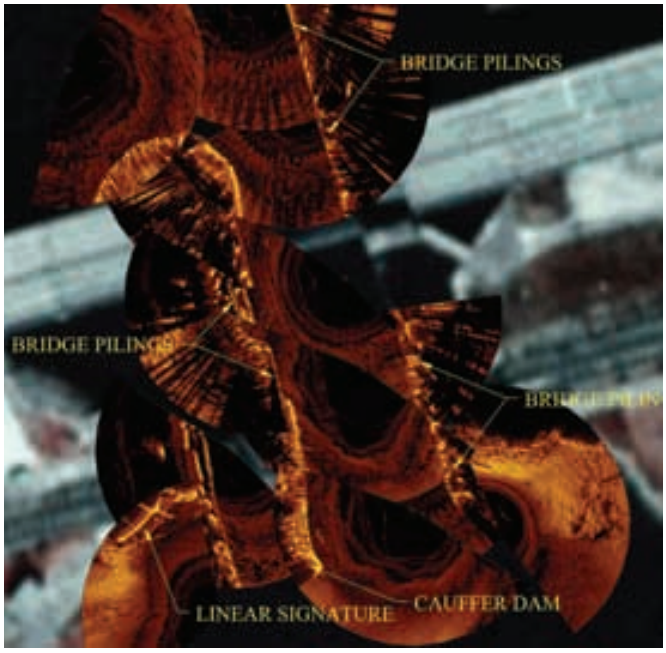
Using specially configured scanning sonar and software, Fenstermaker's Acoustic Imaging Group is gathering visuals of the underwater portions of support structures for vehicular and railway bridges that cross the canal at Almonaster Ave., Florida Ave. and Seabrook and analyzing them for damage.

The group is also scanning the canal for sunken barges, ships, boats and other debris that could impede harbor traffic. The results are then shared with Boh Bros., Modjeski and Masters Consulting Engineers and the U.S. Army Corps of Engineers.

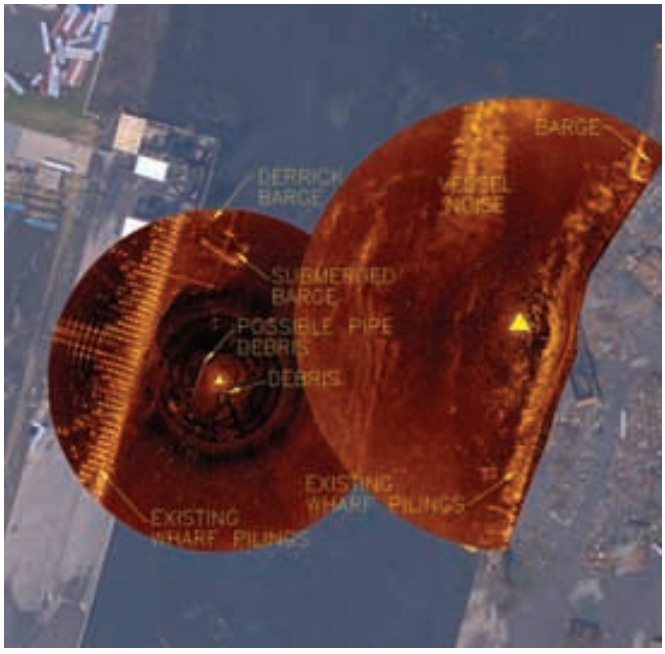
Fenstermaker, a 55-year-old surveying, engineering and environmental consulting firm based in Lafayette with offices in New Orleans, Baton Rouge and Houston, provides acoustic imaging and measurement services. The firm employs a mechanically steered-beam, digital, high-resolution scanning sonar units. The equipment, config-



Underwater Inspection of Bridge Structure Florida Street Bridge, New Orleans, La.



Underwater inspection of structure Seabrook Bridge, New Orleans, La.



Underwater inspection of sunken barge Wharf at Florida St. Bridge, New Orleans, La.

ured under the direction of Fenstermaker's Underwater Acoustics Group, is designed to maximize performance and resolution in shallow brown water or turbid environments, and can be mounted on a vessel or submerged into the water on a tripod to conduct its scans.

Boh Bros. Construction Co., L.L.C., an established construction firm specializing in industrial and commercial projects, marine construction, dock work and bridges, is under contract with the U.S. Army Corps of Engineers to remove obstructions and debris from the bottom of the canal.

"Our Acoustic Imaging Group utilizes the most advanced technologies in imaging data collection and visualization," said Kam Movassaghi, Ph.D., P.E., president Fenstermaker. "The devastating hurricanes of the past several weeks have tested the resources of the state of Louisiana and its people. We are pleased that we are able to use this advanced technology to assist government agencies and businesses in this tremendous recovery effort."

SeaBat 7128

The SeaBat 7128 is designed for underwater imaging applications on a surface vessel, ROV or AUV platform to water depths of 6000 m. The system is a single and/or dual frequency (200/400 kHz) forward-looking sonar. In the 200 kHz configuration, the receiver covers a 130 degree x 27 degree field of view, with a typical range of 500 m (in the 200 kHz configuration) or 200 m (in the 400 kHz configuration). The SeaBat 7128 is capable of producing digital data, either pre-beamformed (hydrophone channel) or beam data. The data stream is operator configurable.

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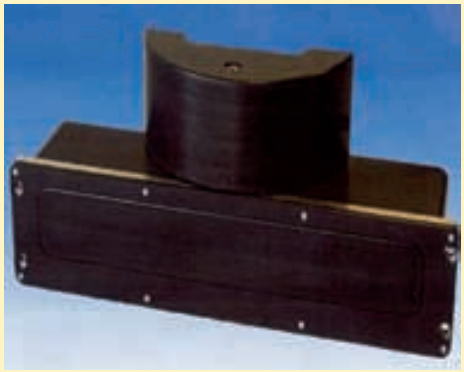
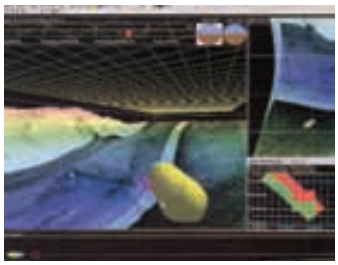


ROVer's Eye



ROVer's Eye Main GUI in real-time, showing the ROV in a two-up view of Sydney Harbor, using Klein 5500 sidescan sonar and Seabat 8101. ROVer's Eye provides a high-fidelity of the physical relationship between the ocean bottom derived from multibeam sonar and a texture image that is overlaid upon the ocean bottom structure, typically derived from sidescan sonar; and a perspective-accurate, properly scaled model of a target vehicle. The system enhances the situational awareness of the ocean environment for mission targets and obstacle avoidance and provides a method to plan missions and paths for vehicle navigation. ROVer's Eye functions in low light or poor water clarity environments and may be used in a variety of applications including terrain visualization, search and recovery, route surveys, oil field inspection and general seabed mapping.

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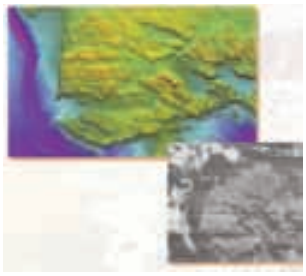
Multibeam Bathymetry and Acoustic Imagery



Fugro Pelagos, Inc. has made advances in the collection and processing of high-resolution acoustic bathymetry and imagery from Multibeam Echosounder Systems. Benefits of use include improved quality from Multibeam Acoustic Imagery (higher signal-to-noise ratio and higher resolution); precise geo-referencing of image pixels; and interactive web delivery of data and images. Vessel motion is applied to improve geo-encoding, and backscatter data is refracted, with backscatter from bad soundings discarded completely. The system features improved sounding accuracy and fully implemented Applanix TrueHeave.

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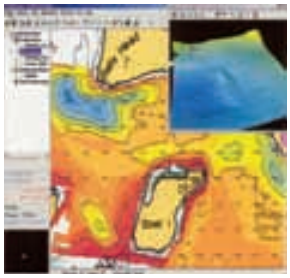
Triton Hydrographic Bundle



Triton's Hydrographic Bundle is an integrated suite of software designed for all phases of multibeam surveys and can be used for survey planning, data acquisition, real-time processing and off-line data analysis. The system's components include applications for data acquisition, sonar interface, real-time data processing, GIS for processed data display, and survey planning/control. The modularity of the software enables expansion as survey capabilities grow. The system features include accurate logging of all data associated with a multibeam system (including beam amplitude, backscatter, etc), real-time correction and filtering of bathymetry and line planning and control during survey.

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AN/WLD-1 Remote Minehunting System

Lockheed Martin's AN/WLD 1(V) Remote Minehunting System (RMS) is designed to allow combatants to react swiftly and independently to mine threats without impacting other warfare missions. Launched and controlled remotely from forward-deployed ships, RMS gives Carrier and Expeditionary Strike Groups an organic, real-time, over-the-horizon mine reconnaissance capability. The unmanned, semi-submersible RMV tows a Variable Depth Sensor to detect, localize, classify and identify moored and bottom mines. Other key elements of the system include line-of-sight and over-the-horizon real-time data links, a shipboard launch and recovery subsystem; and a software segment, which integrates AN/WLD-1(V)1 into the ship's AN/SQQ-89(V)15 Undersea Warfare Combat System.

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profile

Woods Hole Group

Button Down Scientists Roll Up Their Sleeves

By Bill Grafton

In 1986, Dr. David Aubrey founded an environmental, scientific, and engineering firm as a commercial spin-off from the Woods Hole Oceanographic Institution in Woods Hole, Mass. Since its inception, the Woods Hole Group has quietly earned the respect and recognition of the global marine environmental community as a high-end scientific and engineering firm. Its staff has experience with some of the earliest oceanographic monitoring programs in the Gulf of Mexico, assisted with the testing and deployment of the core technology for real-time monitoring systems in ports and harbors, paved the way for development of environmental protection policy in the Caspian, Yellow, and Black seas, provided large-scale beach nourishment solutions for some of the most notable shorelines in America, and provided scientific rational for industrial discharge permits for a number of reverse osmosis and electric generating facilities including a nuclear powered facility.

These and a stream of new projects tap into the Woods Hole Group's core scientific and engineering capabilities and challenge the firm to progressively expand its staff to support its analyses with accurate and defensible field measurements. The solution: field-ready teams of scientists and engineers- the same people with the breakthrough thinking who roll up their sleeves, work with equipment, and take measurements to support the analyses.

Dr. Aubrey, founder and CEO, said: "This trend toward committing more resources in the area of field measurements is in line with our long-term goal of applying science to real-world problems. Success means having confidence in the quality of your data and knowing that your analysis is properly supported." Dr. Aubrey himself sets the standard as he has climbed the Altai Mountains in central Asia, scoured the deserts of the Middle East, trekked through the mangroves forests of Africa, traversed the wide, suction-like mudflats of Jiangsu Province in China, and logged more than 2,000 dives in coastal waters, all in support of applied science and engineering design.

The perception of the firm has always revolved around its scientific analysis capabilities and innovative responsiveness to its clients, but below the surface is the Woods Hole Group's team of measurement and field deployment experts that have the experience and stamina to implement what they design. These field teams are as much at the heart and soul of the firm today as its more highly touted scientific foundation. Bob Hamilton, Vice President of Business Development and a Coastal Engineer said: "We are still changing the perception of us as the button-down scientists from up-North."

Drawing from some of the highest level of scientific knowledge, personnel, and experience, the field staff works with the scientists to solve challenging problems in demanding environments, and they are not reluctant to spend long, taxing days on an offshore facility, or in the desert. For example, as NOAA's sole commercial Operations and Maintenance (O&M) contractor at several of NOAA's Physical Oceanographic Real Time Systems (PORTS) programs, Woods Hole Group continually sends engineers and technicians into the field, boarding vessels, climbing buoys, installing and replacing parts, testing equipment, taking measurements, and reporting the results — winter, spring, summer and fall.

Dr. Bruce Magnell, Oceanographer and Systems Engineer said, "We've expanded our capabilities to provide services to our traditional customers, including those in the government and the oil and gas markets. There has been an increasing demand for real-time environmental monitoring systems both onshore and offshore, to improve safety, guide operations, satisfy government regulations, and most importantly to save our customers time and money. It is satisfying because there are expanded

Gulf of Mexico deployment of a deepwater oceanographic mooring. Hands on design, deployment and training are common activities.

applications for the types of technologies we've helped develop over decades. We have been getting more involved with designing and deploying engineering systems, both environmental and operational, and supporting them in the field. It means rolling up our sleeves and responding quickly and innovatively to new demands."

Woods Hole Group Senior staff have more than two decades worth of real-world expertise taking measurements. They've been fighting through the reeds and swatting the bugs to design, construct, and monitor wetland and habitat restoration projects. They've worked with dredges to move sand onto eroding beaches. The company has designed and overseen construction of coastal structures, and they have sampled raw oil product in the coastal margins of Saudi Arabia from the 1991 Gulf War.

Senior scientists and engineers have groomed their junior level counterparts preparing them to engage in real-world assignments taking measurements, including the down and dirty jobs such as turning wrenches, wiring boards, and collecting mud and core samples. These junior staff members are deployed to project sites near and far, taking with them a scientific tradition, expert craftsmanship and a dedication to rugged physical work.

Providing a high level of scientific and engineering expertise to clients using this new generation of staff is a cornerstone of Woods Hole Group's business model. Hamilton said, "Our team is at home climbing a 160-ft. tower to service meteorological sensors designed to plan the future of wind power development, climbing aboard deepwater oil rigs installing real-time met-ocean and operational monitoring systems, diving to install bottom-mounted oceanographic equipment, or surveying the deserts of Central Asia and the Middle East. As a company, we are equally at home behind a computer assessing ecological risk, computing extreme wave and current conditions, or applying a complex three-dimensional numerical model."

"Staff development is a key requirement, and one that fits academic experiences of our senior staff" said Dr. Lee Weishar, Senior Scientist and Coastal Engineer. Instead of training and mentoring Ph.D. students, senior staff members are now spending their time broadening and deepening the skills of younger staff that have chosen industry over academia.

NOAA Ports Technicians at work installing a buoy-mounted current monitoring system in Chesapeake Bay.

With the price of petroleum going through the ceiling, burgeoning demand for deepwater oceanographic monitoring systems has given Woods Hole Group yet another opportunity to implement measurement solutions around the world. To meet market demand, they opened a new office in Houston. Hamilton said, "Since we want to properly support our customers in the oil and gas business, we've opened an office in Houston, the worldwide headquarters of the oil and gas industry. Now we are able to provide a high level of service in our clients' backyard. It is important to be responsive in this competitive market."

Woods Hole Group already operates real-time monitoring systems on offshore exploration and production platforms world-wide, and deploys field engineers to install, and maintain the systems, and troubleshoot problems. Now, with an office in Houston, it is positioned to provide the region with quick response to emerging requirements in the Gulf of Mexico.

Twenty-five year veteran of the oil and gas industry, John Roscoe-Hudson recently joined the firm and brings a unique insight about what he's noticed in Houston. "While Woods Hole Group has been working with the oil and gas industry's engineering departments for years, it amazed me how little these and other potential customers knew about the rest of the work the company does. We have lot of

work to do to achieve recognition across the industry for the full range of services we can provide."

At refineries and other industrial facilities, the firm investigates effects of effluent discharges on the environment, including developing defensible models and performing analysis necessary to secure environmental permits. Woods Hole Group also evaluates environmental impacts, and prepares Environmental Impact Statements (EIS) for natural gas pipelines and Liquefied Natural Gas (LNG) facilities in sensitive habitats.

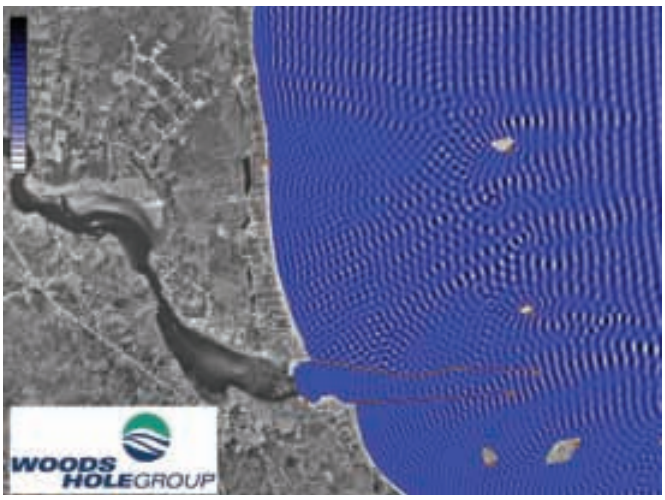
Today, you will find the Woods Hole Group's footprint on almost every continent. Aubrey's dedication and passion to tackling the world's most demanding, large-scale environmental projects have opened the door for his firm's broad spectrum of environmental services. Dr. Aubrey quite literally takes this personally. For instance, he has now committed his time in the Middle East to take on the challenging marine, coastal, and terrestrial environmental problems of this strategic and sensitive area. Weishar said, "Global water scarcity is typified by conditions in the Middle East. The Tigris and Euphrates rivers have been dammed, so only a fraction of their flow continues.

Marshes have been destroyed in Iraq by water diversion and in Saudi Arabia by oil spills. The outlook of water in the region continues to look bleak.

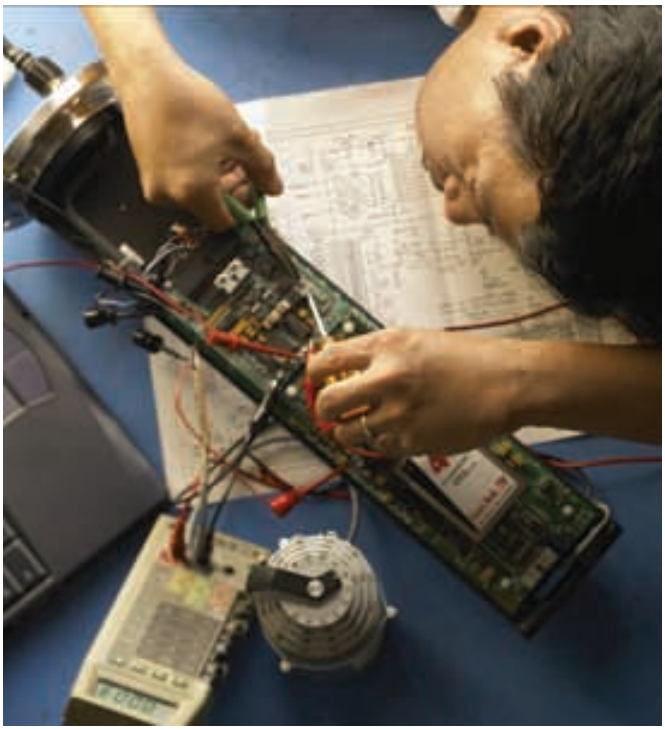
Woods Hole Group has established a regional office in Riyadh, Saudi Arabia, to serve these water and environment related markets."

Although the company retains its roots in basic science and high technology, the core of the company now focuses on balancing its applied work in the lab, at the desktop, and in taking real-world measurements. This has proven to be a winning formula for the Woods Hole Group. Now they are looking to get the message out there. Hamilton said, "Building on our coastal and marine origins, Woods Hole Group has grown to meet environmental demands in wet and dry, extreme environments the world over.

We want the environmental community to recognize the full breadth of capabilities that we offer, so they know where to turn to with their requirements."



Wave model results help optimize shore protection structure and beach nourishment designs.



Final touches in the engineering lab. Custom and off-the-shelf hardware and software are equally common to Woods Hole Group's engineering staff.

United States Navy Diver: Performance Under Pressure

By Mark V. Lonsdale
Foreword by Mark Helmkamp, Supervisor of Diving United States Navy

This illustrated reference book provides a comprehensive overview of United States Navy Divers. It is an elaborate, oversized, hard-cover book, packed with full-color photos highlighting of diving history, navy diving equipment, diver training, and organization to the present day global war on terrorism.

Although *United States Navy Diver; Performance Under Pressure* primarily documents navy diving today; the divers, scientists and engineers of the U.S. Navy Diving Program have spent over a century pushing the limits of human endurance and technology to improve both diver safety and operational capabilities. Readers will absorb the text and photographs with a feeling of pride and appreciation for those who have proudly served our nation as Navy Divers.

Contents include

- Evolution of U.S. Navy Diving
- Supervisor of Salvage & Diving
- U.S. Navy Diver Rates, Ratings and Classifications
- U.S. Navy Diving Equipment
- U.S. Navy Experimental Diving Unit
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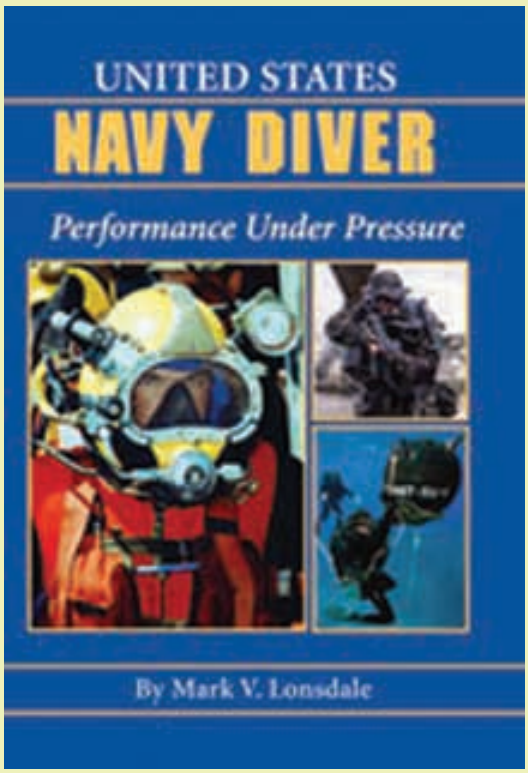
- Basic Underwater Demolition
- SDV Teams & Navy Divers



- U.S. Marine Combatant Divers
- U.S. Navy Combat Camera Divers
- Deep Submergence & Submarine Rescue
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- Subs, Spooks & U.S. Navy Divers
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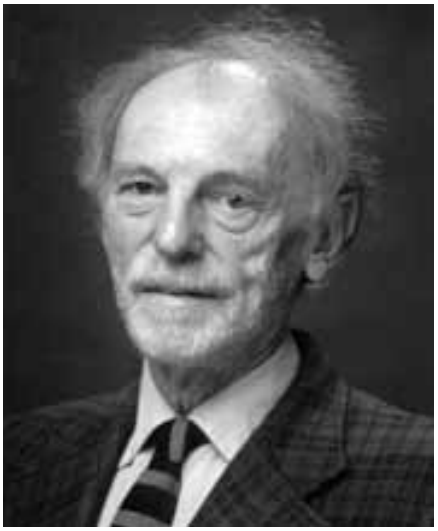
Leader in Marine Hydrodynamics Dies

John V. Wehausen, professor emeritus of engineering science at the University of California, Berkeley, and one of the world's leading researchers in hydrodynamics, died on Oct. 6, 2005 at the age of 92.

"Many of us in the marine academic field consider John Wehausen to be a pioneer in marine hydrodynamics," said Ronald Yeung, a UC Berkeley professor of mechanical engineering who chaired the campus's former Department of Naval Architecture and Offshore Engineering and considered Wehausen a mentor. "His background as an applied mathematician allowed him to set the framework for mathematical analysis of important ocean- and ship-related problems. This became increasingly important as practitioners sought to build offshore drilling systems that could reach depths of up to 2,000 meters and ships that could reach speeds over 50 knots yet survive the worst storms at sea."

Wehausen contributed original research in the areas of wave resistance, floating-system motions, ship maneuverability and ship-generated solitary waves. In 1960, he published one of his most influential works, the comprehensive review article "Surface Waves," co-authored by the late UC Berkeley professor Edmund V. Laitone. The article was originally published in the Encyclopedia of Physics and to this day is still used as an important resource for understanding the dynamics of water waves. At UC Berkeley, Wehausen helped form the Department of Naval Architecture in 1958 with support from the Office of Naval Research. At



the time, only three other U.S. institutions -- Massachusetts Institute of Technology, the University of Michigan and the Webb Institute -- offered accredited degree programs in naval architecture.

"The intention was to develop a program that would stress fundamental hydrodynamics and fundamental structural mechanics in contrast to the applied programs that existed elsewhere in the country," said J. Randolph Paulling, a UC Berkeley professor emeritus of naval architecture and a colleague of Wehausen's for more than 40 years. "Water wave problems constitute an area of complex mathematics, and Wehausen's background in mathematics was exactly what the Office of Naval Research wanted. There were others in the world working on the mathematical theory of waves, but I think it's safe to say that Wehausen was preeminent in the U.S. at that time."

The department eventually evolved in 1996 into a graduate group in ocean engineering within the graduate division. This fall, it became a major field of study within the UC Berkeley Department of Mechanical Engineering.

In 1937, Wehausen began his first teaching position as an instructor in mathematics at Brown University. It was there that he met his future wife, Mary Katherine Wertime, a Ph.D. candidate in mathematics. They had been married 62 years when she died in January 2001.

He went on to hold other teaching positions at Columbia University and the University of Missouri from 1938 to 1944. During World War II, he worked for the U.S. Navy in operations analysis from 1944 to 1946 before joining the David Taylor Model Basin, a Navy research and development lab in Bethesda, Md. now known as the Hydromechanics Directorate at the Naval Surface Warfare Center.

His three-year tenure at the David Taylor Model Basin would prove formative. There, Wehausen met and was greatly influenced by renowned German ship hydrodynamicist Georg Weinblum. Wehausen's interest in water-wave theory and ship hydrodynamics can be traced to this time period.

Wehausen served as head of the Mechanics Branch of the federal Office of Naval Research from 1949 to 1950, and was then selected as executive editor of the journal Mathematical Reviews, a position he held from 1950 to 1956. In 1956, he was recruited by UC Berkeley, where he developed the graduate degree program in naval architecture.

He retired from UC Berkeley in 1984, but remained active in

research. He was a member of the National Academy of Engineering and a fellow of the Society of Naval Architects and Marine Engineers, which awarded him a Davidson Medal for outstanding scientific accomplishment in research. Among the many other honors he earned throughout his career was an honorary doctorate degree from the Joseph Fourier University in Grenoble, France, where he had taught during a sabbatical leave.

In June 2002, colleagues paid tribute to Wehausen by organizing a Special Symposium of the Offshore Mechanics and Arctic Engineering Conference in Oslo, Norway. More than 100 colleagues, friends and former students attended the symposium. At that event, Wehausen was awarded the American Society of Mechanical Engineers International Lifetime Achievement Award.

Memorial donations and gifts can be made out to the UC Regents, John Wehausen Memorial Fund, c/o College of Engineering, University of California, Berkeley, 201 McLaughlin Hall, MC 1722, Berkeley, CA 94720-1722. The funds will be used to establish a scholarship for graduate students studying marine hydrodynamics.

General Atomics, Kongsberg, C&C Sign Agreement

General Atomics, Kongsberg Maritime and C&C Technologies agreed to cooperate on the development of AUVs and associated technologies. Kongsberg Maritime, manufacturer of advanced hydroacoustic instruments, the HUGIN family of AUVs and other maritime electronic

products, has signed a cooperative agreement with General Atomics and C&C Technologies via its affiliate, Kongsberg Underwater Technology Inc, located in Lynnwood, Wash. General Atomics (GA) and its affiliates, headquartered in San Diego, Calif., are high-technology development companies in areas ranging from nuclear technologies and advanced defense and energy systems to Unmanned Aerial Vehicles (UAVs), including the Predator, a remotely operated surveillance aircraft. GA is currently active in systems integration for several U.S. Navy programs, including an Electromagnetic Aircraft Launch System, an Advanced Arresting Gear, Integrated Fight Through Power Conversion equipment, a Superconducting Homopolar Propulsion Motor, and an Electromagnetic Railgun. C&C Technologies, Inc., a Lafayette, La., based survey company, presently operates two HUGIN 3000 AUVs and has planned to take delivery of a third, 4500 m depth rated HUGIN.

Teledyne RD Instruments User's Workshop Returns to Europe

Teledyne RD Instruments said that its 2006 ADCPs in Action User's Workshop will again take place in Europe, scheduled for June 7-9, 2006 in Cannes, France. ADCPs in Action is a forum that was created by Teledyne RDI several years ago to bring the community together for an exchange of information between ADCP/DVL users, industry experts, and third party manufacturers. Central to the event are 25 industry experts presenting their latest field experience and findings, interspersed with Teledyne RDI product/software training, industry forums, and data analysis clinics.

Industry co-sponsors for this event include key oceanographic product manufacturers and service providers. Confirmed co-sponsors to date include: Aqua Vision, Benthos, Codar, EIVA, Flotation Technologies, IXSEA, and OTT. Teledyne RDI is seeking speakers, co-sponsors and attendees for this important event.

For full details and online registration, please visit www.rdinstruments.com, or contact: Ms. Gina Lopez, Teledyne RD Instruments, Tel. +1-858-693-1178, e-mail: glopez@rdistruments.com

Transocean's Nautilus Receives Two-Year Deal

Transocean said that a subsidiary of Royal Dutch Shell (Shell) has award-

ed a two-year contract extension for the company's Fifth-Generation moored semi-submersible rig Deepwater Nautilus. The two-year contract extension is expected to commence in December 2006, in direct continuation of the rig's current contract. Revenues of approximately $310 million could be generated over the two-year extension period, excluding revenues for mobilization, demobilization and client reimbursables.

The Deepwater Nautilus is currently operating for Shell Exploration and Production in the U.S. Gulf of Mexico and is expected to continue drilling operations for the remainder of 2005 and into 2006 before requiring an estimated 60 days of out-of-service time during 2006 to complete repairs of all remaining storm-related damage, which pertains mainly to the rig's mooring system. The rig, which entered service in 2000 following its construction in Ulsan, South Korea, is capable of operating in water depths of up to 8,000 ft.

Oceanscan Welcomes Sri Lankan President

Manel Monteiro, Sales & Marketing Director of Aberdeen based company, Oceanscan Limited, met with the newly appointed President of Sri Lanka, Mahinda Rajapakse, during a recent visit to the country. Against fierce competition from other companies, Oceanscan have been specifically selected to introduce new and highly technological equipment to Sri Lanka. During the recent visit Mr. Monteiro carried out successful trials of Oceanscan's new and innovative products, much to the satisfaction of the Government bodies who attended these trials.

EGS Intl. Buys Dual Head EM 3002D

EGS International bought a dual head Kongsberg Maritime EM 3002D shallow water multibeam system along with real-time operating software SIS, (Seafloor Information System) and Neptune post processing software. A Kongsberg Seatex MRU H attitude sensor was also purchased to provide attitude corrections for the system.

The system was initially commissioned on the inshore survey/research vessel Wessex Explorer for work around the U.K. However the installation has been designed for portability to be deployable for projects worldwide.

PSS Wins Singapore Navy Contract

Perry Slingsby Systems, in association with its local agent and tooling rental service provider, Cynergetix, won a Maintenance Contract from the Singapore Navy. The contract involves a full maintenance check and provision of spare parts for the Singapore Navy's Super Spartan ROV system. The works are to be carried out by Cynergetix engineers, who have been trained by PSS technicians, on both the ROV's mother vessel and in Cynergetix' Singapore workshop. The Super Spartan ROV is destined to become a key part in the Singapore Navy's Submarine Rescue Capability, which is currently at the Tender stage.

Valkyrie Establishes New Record

Valkyrie Commissioning Services, Inc. reported that it set a new subsea hydrotesting depth and pressure record by pressurizing a subsea-to-subsea pipeline to 12,563 psig, and remotely recording the hydrotesting data in 5,715 ft. of seawater. The hydrotest was accomplished using Valkyrie's Subsea Pipeline

Commissioning System (SPCS) known as Denizen. Designed for ultra deepwater applications, Denizen is operated in conjunction with a work class Remotely Operated Vehicle and currently has the ability to work in water depths to 10,000 ft. and achieve pressures up to 20,000 psig.

EM 710 contract

The Swedish Maritime Administration has purchased an EM 710 1x1 with the dual swath option, along with SIS (Seafloor Information System) and Neptune post processing software. The system will be installed on the ice-breaker vessel Ale. The production and delivery of the systems will be done with very short notice, displaying the flexibility of Kongsberg Maritime.

Training Seminar a Success

Over 40 professionals from around the U.S., Canada, and Germany recently participated in a hands-on training seminar focusing on using side scan sonar and sub-bottom sonar software. The two-day event held in Annapolis, Md., was hosted by Chesapeake Technology, Inc. (CTI), an up and coming leader in developing software for the underwater survey industry.

"This was a truly interactive workshop," explained John Gann, CTI's Vice President of Software Development and facilitator at the November 2-3, 2005 event. "Almost all those attending shared real-world techniques for utilizing these powerful software applications. Tips and solutions were shared from clients who have developed and implemented them in their own day-to-day use."

Gann, along with presenters from Blacklaser Learning, Klein Associates Edgetech, and some U.S. government clients gave formal presentations sharing key information on practical uses for the software.

"The workshop also provided SonarWiz and SonarWeb users the opportunity to guide development of future CTI releases by passing on their experiences, needs, and preferences directly to us," said Gann, "This adds to the value of the event."

Economides to Address MTS Luncheon

Dr. Michael J. Economides, Professor at the Cullen College of Engineering, University of Houston, an authority on the petroleum industry and the author of 11 books and numerous articles on the industry, will be the guest speaker at the next MTS Houston Section luncheon on January 26. Professor Economides will discuss the current state of the industry, including discussing the question of whether oil supplies have peaked — a question that has received a great deal of media attention in recent months.

All luncheon attendees will receive a complimentary copy of Professor Economides' book, the Color of Oil (courtesy JP Kenny). Attendees will also have the opportunity to subscribe to his monthly publication, World Energy Monthly Review, at 50 percent of the normal subscription rate. Lunches are held at the Westchase Hilton, 9999 Westheimer, from 11:30 to 1:00 p.m. The cost is $25 for members with a reservation or $30 for nonmembers and walk-ins. To reserve a place, register online through the web site at http://www.mtshouston.org.

Perry Slingsby System to Onyx Special Services

Perry Slingsby Systems (PSS) announced that Onyx Special Services purchased Triton XLS17. Triton XLS17 is reportedly the first XLS 150 hp system using the new optimized high output 15-in. thrusters. In May 2006 the Triton XLS17 will be installed onto the recently acquired vessel Kingfisher and will be used for ROV services in the Gulf of Mexico. "The incorporation of the optimized 15-in. thrusters into the propulsion system of the Triton XLS, makes full advantage of 150 horsepower available," said Martin Anderson, Managing Director and CEO, Perry Slingsby Systems.

UK Hydrographic Office Acquires SevenCs

The UK Hydrographic Office recently acquired SevenCs, a German navigational software supplier.

Dr. Williams, Chief Executive of the UKHO said "We are delighted to incorporate the skills set of SevenCs into the UKHO family. This is a natural alliance for us, and the opportunity to work with a very capable ECDIS supplier will be key in developing new products for the mariner in the future."

SevenCs will continue to operate out of the Hamburg base, with the technical directorate of the UKHO ensuring full compatibility across the production systems involved."

NOC Receives Coda GeoSurvey System

Dr. Justin Dix and Stephen Auld.

The National Oceanography Center in Southampton, U.K. (NOC) recently took delivery of a Coda DA200 Geophysical Acquisition System for use with their numerous existing sensors including boomer, chirp sub-bottom and sidescan sonar systems. Destined for a wide range of applications from teaching through to academic research, the DA200 will be the prime acquisition system for much of NOC's inshore work. CodaOctopus has further boosted the center's order with the sponsorship of a further two full Coda GeoSurvey post-processing suites worth over $90,000. Together with the three Octopus 360+ seismic acquisition systems and Octopus 361 processing software delivered last year and installed on NOC's larger research vessels, this recent order marks a significant milestone for Coda GeoSurvey.

Sabeus Wins $1.56M NAVSEA Contract

Sabeus Inc., a developer of fiber optic sensing technology for military undersea surveillance and perimeter security applications, won a $1.56 million contract by the Naval Sea Systems Command (NAVSEA) for the development of an All Optical Embedded Fiber Bragg Grating (FBG) Sensor Array.

Exploration Agreement Signed

National Joint Stock Company Naftogaz Ukrainy (NAK) and Shell Exploration and Production signed a Cooperation Agreement covering licenses, agreed work program levels and the main terms of joint activities at a ceremony attended by President Victor Yushchenko of Ukraine, British Prime Minister Tony Blair, Chairman of the Board of NAK Naftogaz Ukrainy Olexiy Ivchenko and Shell's Executive Director for Exploration and Production, Malcolm Brinded. This is the first important milestone after the two companies previously agreed to carry out joint studies in an area of over 31,000 sq. km. in the Dniepr-Donets Basin, located in central-eastern Ukraine and thought to contain resources of natural gas. The agreement involves a total initial investment by Shell of around $100m.

C&C Technologies Buys a Third Octopus F180

With the purchase of a third unit, C&C Technologies has adopted the Octopus F180 as its primary GPS aided attitude and positioning system. The F180 is compatible with all hydrographic survey systems including Simrad multibeam systems used by C&C. With standard data outputs including EM3000 motion and heading strings in addition to TSS1 motion and standard NMEA heading and positioning formats, the Octopus F180 interfaces easily to all multibeam sonars.

Kongsberg Signs Conract with Schilling

Kongsberg Maritime won a contract to supply Schilling Robotics LLC with underwater cameras for installation on four newly built ROVs. Schilling will supply Bergen, Norway-based Geoconsult AS with its 4Km UHDT (Ultra Heavy-Duty) Hydraulic ROVs. A total of 50 Kongsberg cameras will be installed and each ROV will be fitted with one Kongsberg imaging sonar head and two altimeters. The ROVs are rated to depths of 4000 m. Geoconsult AS provides ROV, AUV, and UUV services as well as pipeline inspection.

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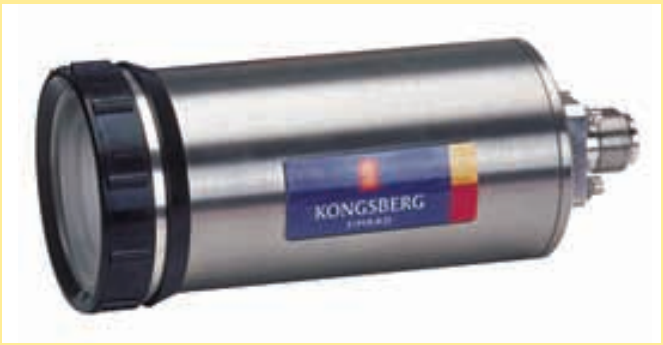

Schilling Robotics' TITAN Integrated Wrist Camera

Schilling Robotics' new integrated wrist camera for TITAN manipulators features a titanium camera housing for protection and internal cabling that is designed to eliminate cable snags and abrasions. The high-resolution color camera, which includes LED lights with two illumination levels, can be ordered in either NTSC or PAL format. The depth rating is 4000 m.

The wrist camera is compatible with any TITAN manipulator arm that features in-arm slave electronics. The camera can be ordered already installed on a new TITAN 4 manipulator system or can be ordered as a kit for existing TITAN 4 arms and TITAN 3 arms with in-arm slave electronics.

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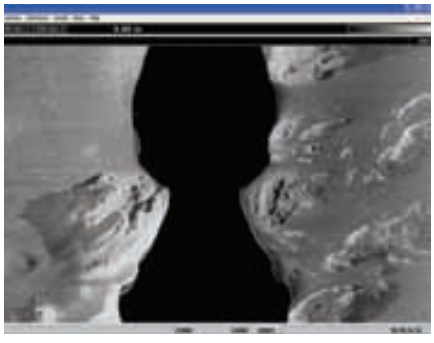
EA 400/SP Hydrographic Echo Sounder Upgrades

Early in 2005, a new EA 400 portable splash proof (IP56) unit was introduced. New software for the EA 400/SP/600 was released during the summer of 2005. The EA 400SP is a dual frequency echo sounder operated with a notebook PC. 38/200kHz frequency is the standard configuration (vertical or side looking transducer(s)) and it is powered with 12VDC. The new EA 400 and EA 600 software, version 2.2.0.1, has been improved with several new features, such as side enhanced looking imaging, replay function and new data formats.



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Triton Imaging V7.0 Software Release

Triton Imaging, Inc. released version 7.0 of the Triton software suite. The release includes improvements to Triton Isis SS-Logger, Triton SB-Logger, Triton BathyPro and Triton Nav. The Triton 7.0 Release features a new application: the Triton Isis MB-Logger, a data logger for multibeam echosounder data. Based on Triton's flagship Isis MBSS-Logger, MB-Logger features the interfaces and quality control displays required for accurate logging of sounding data

from a multibeam echo sounder. Upgrade paths exist to support acoustic backscatter data, real-time DTM generation, real-time mosaicking, and automated quality control with the addition of the Triton Survey Monitor.

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SpiderBot ROVs

The SpiderBot ROV by Oceaneering International Inc was created to penetrate shipwrecks and achieved recognition during exploration of the Titanic by conducting underwater surveys of tight interior spaces. The SpiderBot ROV is suited for work considered too dangerous or inaccessible for divers, larger ROVs, or manned submersibles. The system provides high-resolution imaging, close-in inspection of subsea equipment, and documentation of shipwreck and other debris. It is rated to 20,000 fsw and is driven by a pressure-compensated High Energy Electron Accumulator Array power source, allowing for up to 18 hours of operation.

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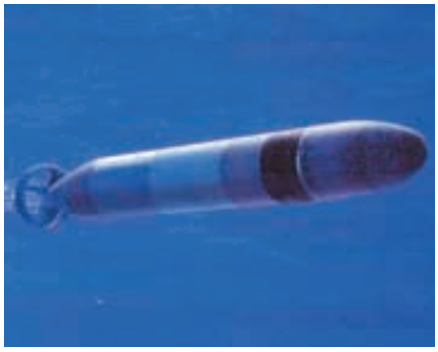
Enhanced ASW Training

Lockheed Martin Sippican's MK 30 Mod 2 and MK 39 EMATT ASW targets are designed to give Anti-Submarine Warfare (ASW) crews focused training to maintain critical ASW combat skills. Designed for maintaining ASW readiness at the unit and battle group level, the MK 30 Mod 2 is a capable target for use on Acoustic Tracking Ranges. It consists of Target Undersea Vehicles (TUVs), associated Support and Test Equipment (S&TE) and External Control Equipment (ECE). The MK 39 EMATT offers the flexibility and

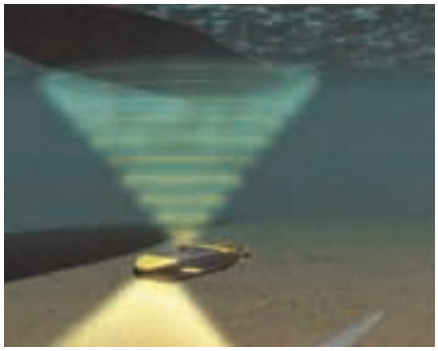


fidelity to be used either on range or in the open ocean. It is a small submarine-like target equipped with acoustic and non-acoustic signatures and can be deployed from an underway submarine to enhance fleet readiness in anti-submarine warfare.

Visit www.maritimeequipment.com/mt & Click No. 23

AV-Trak AUV Navigation System

AV-Trak is a combined Long BaseLine (UBL) and Ultra-Short BaseLine (USBL) transponder packaged in a lightweight housing that is depth rated to 3,000 m. The unit has been designed to meet the requirements of a variety of AUV navigation operations, including tracking during deployment and recovery operations, AUV to AUV ranging, emergency relocation and more. The device is fully compatible with Sonardyne's family of LBL and USBL navigation equipment, software and systems. AUV installation and maintenance is simplified by the use of a separate compact transducer attached via a one meter cable.



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Miniature High Density Connectors

Impulse's miniature high density connectors are available in five shell sizes with 2 to 78 contacts and feature a stainless steel body with naval bronze engaging nut. Special finishes

and alloys are available upon request. Bulkhead connectors are available in threaded or flanged versions with a removable glass reinforced epoxy insert, and straight and right overmolds are available for cable connector plugs. The connectors have up to a 10,000 psi pressure rating in mated condition; the bulkhead connector design open face is rated to 5,000 psi.

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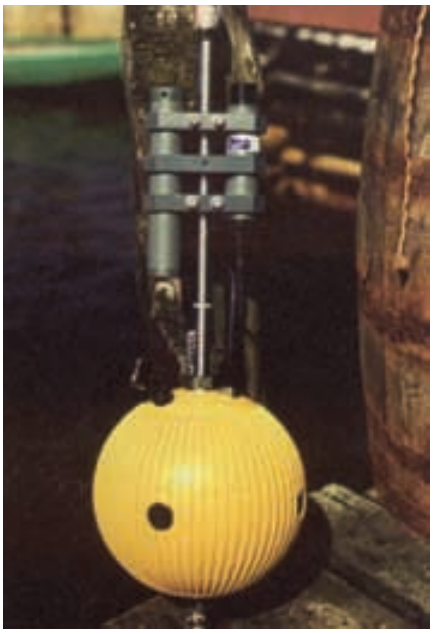
Wave and Tide Gauge Family

InterOcean Systems' S4 Directional Wave Family measures directional waves by using the principle of analyzing the current speed and direction record to determine the orbital velocity components of particular frequency bands and combining that information with wave height as measured by the pressure sensor with automatic depth attenuation correction. The



data is converted from the time domain to the frequency domain and analyzed using Fast Fourier Transform (FFT) techniques. The directional wave information is available as output from InterOcean's Wave for Windows analysis software or may be output directly from the new generation S4ADW-I which processes this data internally for immediate availability to the user without the need for external software.

Visit www.maritimeequipment.com/mt & Click No. 26

Licensing Agreement for AlphaPRIME Technology

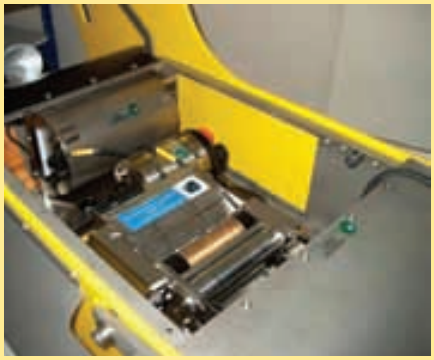
Perisai Petroleum Teknologi Bhd of Malaysia has become the world's first company licensed to manufacture and deploy AlphaPRIME oil field technology following a $7.44 million joint venture with Alpha Thames Subsea of the UK. The new company is marketing technology for reducing oil and gas production costs and capital expenditure. The creation of Alpha Perisai Sdn Bhd follows the reclamation of the intellectual property rights of AlphaPRIME from SAAB Technology. David Appleford, managing director of Alpha Thames Ltd and his management team, the original creators of AlphaPRIME technology, are now operating under the name Alpha Thames Subsea Ltd.

Visit www.maritimeequipment.com/mt & Click No. 28

Wet Pluggable Cables

Impulse's wet pluggable cables are available in a variety of sizes and styles, including circular, low profile, mini circular, mini low profile, and micro mini, with two to 18 contacts. Male and female neoprene bulkhead connectors are available with brass or stainless steel body; others available

CTG Aqualine FerryBox



The Chelsea AquaLine FerryBox is a monitoring system that enables sea surface temperature, salinity, chlorophyll-A and turbidity to be monitored along with a vessel's geographical position. The system can provide information for the assessment of long-term trends in coastal water systems for operators, passengers and environmental managers. These systems are plumbed into the ferries' sea-water intake to provide monitoring of the oceans surface layers. Long term scientific quality data sets can be gathered and integrated into operational monitoring networks. The Instrument Frame is the building block for a full AquaLine FerryBox System. The frame provides a platform to allow the integration of several types of sensors and incorporates all the necessary pipe work and valves while allowing accessibility to the sensors for routine maintenance. Data is logged onboard and then transmitted to shore by GSM phone links and satellite systems.

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upon request. The connectors have up to 20,000 psi pressure rating in mated condition; bulkhead connector design open face is rated to 5,000 psi.

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ORE Offshore Delivers 30 Acoustic Release Transponders

ORE Offshore has delivered thirty 8242XS Acoustic Release Transponders to the National Data Buoy Center (NDBC), Stennis Space Center, Miss. The Model 8242XS can be used to release oceanographic moorings or can be used for long baseline transponder navigation. In addition to these typical applications there are a number of specialized uses for these systems, such as opening and closing valves in underwater systems and as emergency recovery systems. The 8242XS has a depth rating of 6,000 meters and boasts a release load of 5,500 kg. The unit is made entirely of Nickel Aluminum Bronze alloy with titanium closure hardware.

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Triton Imaging for TNO-NITG

The Netherlands Institute of Applied Geoscience TNO - National Geological Survey (NITG-TNO) purchased one of Triton Imaging's turnkey shallow-seismic systems. The system will consist of: a Triton industrial topside workstation, Triton software, and an Edgetech 512i sub-bottom profiler. NITG plans to use the system world-wide to conduct sediment-related seabed research.

IVS 3D Announces Record Growth

IVS 3D has experienced record growth in the sales and service of its Fledermaus software suite during FY 2005, ended August 31. "Our tenth anniversary year is marked by an overall 35 percent increase in individual sales and 18 percent increase in the number of clients," said Lindsay Gee, General Manager of IVS 3D. "This type of growth is not just from a few large clients, but from an overall expansion in our product and services around the world in the 2005 fiscal year. With the release of Version 6.2 coming later this year, I think we can expect to see those numbers continue to increase dramatically in the next fiscal year."

For information on posting a job on these pages and on the "JOBS" site at www.seadiscovery.com, contact Dale Barnett at tel: 212-477-6700; fax: 212-254-6271; or e-mail: barnett@marinelink.com

MARINE STRUCTURAL ENGINEER

Job Location: USA, NJ Gibbsboro

Ocean and Coastal Consultants, Inc. is looking for a qualified structural engineer to work in their Gibbsboro, NJ office. The successful candidate must have a minimum of 6 years relevant experience and have passed the E.I.T. exam. A P.E. license is strongly preferred. Relevant work experience must include design of steel, concrete and timber structures. It is desirable to have design experience with relieving platforms, wharves, piers, docks, and other waterfront structures, the design of berthing and fendering systems, and geotechnical work related to waterfront structures. Design of marinas and coastal protection systems is a plus. SCUBA and surface supplied air diving experience is also highly valued. The position will include some field assignments. If you have the requisite qualifications and would like to work for a growing company involved in a wide variety of exciting work, please send your resume.

Doug Gaffney
Ocean and Coastal Consultants, Inc.
20 E. Clementon Rd., Suite 201N
Gibbsboro, NJ 08043
USA

Phone: (856) 248-1200
Fax: (856) 248-1206
Email: dgaffney@ocean-coastal.com
WEB: http://www.ocean-coastal.com

OCEAN ENGINEER/CIVIL/MECHANICAL

Job Location: USA, HI Waimanalo

Looking for a talented and fast-learning civil/ocean/mechanical engineer, preferably with previous work experience, to become a permanent member of our technical staff. Duties would be varied depending on current project commitments and may include computer programming, hydrodynamic and hydraulic analysis, structural design, pipeline design and analysis, limited duration offshore assignments, proposal and report writing, and various marine survey and construction observation duties. Important assets for this position include: An ability to think clearly through technical problems, strong written/oral communication skills, willingness to adapt to a flexible work schedule, willingness to travel, and a desire to learn new skills. Working knowledge of Word, Excel and Autocad are desirable skills. Knowledge and experience in concrete and steel design is a big plus. A Bachelor's degree in one of the above mentioned fields is a minimum requirement. Three years work experience or a graduate degree is preferred. Candidates should hold U.S. citizenship or a green card. Please submit a cover letter and resume with references, date of availability and citizenship/immigration status.

Dale Jensen
Makai Ocean Engineering
PO Box 1206
Kailua, HI 96734
USA

Phone: 808-259-8871
Fax: 808-259-8238
Email: dale.jensen@makai.com

CAPTAIN UNLIMITED

Job Location: USA, TX Houston

Urgently seeking a Captain with valid license - Unlimited Tonnage Vessel for an FPSO in the Mediterranean Sea, available to depart early January 2006. Rotation is based on a 6-weeks ON / 6-weeks OFF schedule which may vary depending on Client's needs. If interested, contact us @ 713-468-3348 or 832-419-0847.

Rick Fielder
FPS, Inc.
11211 Katy Frwy., Ste. 325
Houston, TX 77079
USA

Phone: 713-468-3348
Fax: 713-468-0731
Email: fpstx@ev1.net

SOFTWARE ENGINEER

Job Location: USA, HI Waimanalo

Makai's submarine cable group is looking for a Software Engineer with strong programming skills to perform maintenance, development and occasional offshore operation of our PC-based cable lay planning, simulation and control software. This individual will be responsible for the ongoing software development, customer support, and installation and troubleshooting of software on client platforms at-sea. Important assets for this position include: Engineering or physical science degree, willingness to occasionally perform at-sea work, strong self-confidence, excellent English communication skills, strong interpersonal skills, and have experience with the Windows programming environment with the aptitude and willingness to learn more. Specific experience with Windows 2000/XP, AutoCAD, ArcView or GeoMedia, FORTRAN, C++, Visual Basic and TCP/IP networking is helpful. Applicant must be qualified to work in the U.S. (Foreign born nationals must already possess a green card.) Please send a cover letter and resume to Dr. Jose Andres at Jose.Andres@makai.com.

Jose Andres
Makai Ocean Engineering
PO Box 1206
Kailua, HI 96734
USA

Phone: 808-259-8871
Fax: 808-259-8238
Email: jose.andres@makai.com

ENGINEER/PHYSICIST

Job Location: USA, HI Waimanalo

Makai's submarine cable group is looking for an Engineer or Physicist with a graduate degree and very strong skills in math, numerical methods and programming. Candidate will be learning, maintaining and expanding the capabilities of existing and new complex numerical models developed in FORTRAN, C++, and Visual Basic. Important assets for this position include: An ability to think clearly through technical problems, strong written/oral communication skills and proposal writing, willingness to adapt to a flexible work schedule, willingness to travel, and a desire to learn new skills. A Masters degree in engineering, physics, or applied math is a minimum requirement, and ideal candidates will have 2-4 years experience in physical modeling/programming. US citizenship is preferred. Please submit a cover letter, resume with references, date of availability and citizenship/immigration status to Dr. Jose Andres at Jose.Andres@makai.com.

Jose Andres
Makai Ocean Engineering
PO Box 1206
Kailua, HI 96794
USA

Phone: 808-259-8871
Fax: 808-259-8238
Email: jose.andres@makai.com

MARINE SALES ENGINEER

Job Location: USA, OH Cleveland - West Side

Hyde Marine,Inc. has a technical sales/marketing position available, Inc., which we would like to fill as soon as possible. We would prefer a marine engineer with at least some sales experience. The position is somewhat flexible and would also be suitable for a more experienced person. It has excellent career growth potential. We expect significant sales and product growth over the next several years.

Hyde offers a full range of very competitive benefits and compensation to suit experience as well as performance incentives. Hyde's product line is primarily environmental related shipboard equipment. The job will require travel in North America and some foreign travel. We can promise a challenging, interesting and fulfilling experience and a pleasant and creative environment for the right person.

Tom Mackey
Hyde Marine, Inc.
28045 Ranney Parkway
Cleveland, OH 44145
USA

Phone: 440-871-8000
Email: tmackey@hydemarine.com
WEB: http://www.hydemarine.com

INSTRUCTOR

Job Location: USA, VA Hayes

Chesapeake Marine Training Institute, Inc., (CMTI) has immediate openings and is seeking professional mariners holding a minimum USCG Master license of 200 GT (domestic)

For information on posting a job on these pages and on the "JOBS" site at www.seadiscovery.com, contact Dale Barnett at tel: 212-477-6700; fax: 212-254-6271; or e-mail: barnett@marinelink.com

and five years sea service desiring to share their knowledge with others. Successful candidates will join our team of US Coast Guard approved instructors to teach several courses, including Master to 200 GT, Tankerman PIC (Barge) DL, RADAR, ARPA, ECDIS, Able Seaman, STCW Basic Safety Training, and others. CMTI offers good benefits including medical and dental, retirement plan, paid vacation, license maintenance fees, and more. Prior teaching experience helpful. CMTI is an equal opportunity employer and offers a friendly smoke, alcohol, and drug free workplace.

Captain Guy R. A. Sorensen
Chesapeake Marine Training Institute, Inc.
3566 George Washington Memorial Hwy
PO Box 1153
Hayes, VA 23072
USA

Phone: 804-642-0123
Fax: 804-642-1743
Email: guy@chesapeakemarineinst.com

RVE PROJECT ENGINEER

RVE, Inc. is seeking qualified individuals for unique job assignments. Projects involve evaluation and condition assessments of marine facilities including bridges, bulkheads, piers & platforms.
Follow-up rehabilitative design is often needed with emphasis generally on the underwater elements.
Diving is required.
Qualifications - Registered Professional Engineer, ADCI Certified Commercial Diver, Technical Writing Skills, Structural Design Experience.
Special Features - Good Office/Field Mix - Interesting Travel - Independent Work - Growth Opportunity

Equal Opportunity Employer - M/F
RVE, Inc
PO Box 2927
Corpus Christi, TX 78403

Email: jleach@rve-inc.com

CABLE REPAIR SUPERVISOR

Job Location: USA, TX Houston

Veritas DGC Inc., a $600 plus million public geophysical information and services provider, is one of the world's leading providers of advanced geophysical technologies. Veritas Marine Acquisition, a division of Veritas DGC Inc., is currently recruiting for individuals for our Cable Repair Supervisor position in the Houston office.

The central role of the Cable Repair Supervisor position is to operate an onshore facility for the repair of marine cables for our global fleet. This position will work closely with representatives of the Marine Resource, ATG and Marine Operations groups to ensure that repairs meet our terms of competitiveness and accuracy. This position will be responsible for managing the overall repair activities, providing repair expertise and knowledge in addition to performing line repair duties when needed. The responsibilities for this position will be to oversee and/or perform the evaluation and repair of incoming cables as workload requires; Manage the inventory for repairs and fixed assets at the Cable Workshop; liaise with Marine Inventory Tracking Supervisor on the status of repairs and incoming/outgoing shipments; and generate technical reports and statistics for management on a regular basis. Will also assist with the start-up of a new facility.

Requirements: AS Degree; A minimum of 5 years in-depth knowledge of geophysical cable repair techniques or their manufacture (land, marine or ocean bottom); Supervisory and training experience; Proficient with electrical/optical test equipment; Experience with MS Office Suite and other desktop applications; Excellent time management and motivational skills and the ability and willingness to travel, if required.

We are looking for applicants in the Texas area. Will consider individuals outside of the Texas and USA area if you have appropriate and useful experience.

For more information on who we are and what we do, please visit http://www.veritas-dgc.com. Interested applicants may apply by submitting resume to vgshr@veritasdgc.com. Please indicate where you saw this job posting.

Veritas is an equal opportunity employer.

Trena Gipson
VERITAS GEOPHYSICAL CORPORATION
10300 Town Park Drive
Houston, TX 77072
USA

Phone: (832) 351-8300
Fax: (832) 351-8721
Email: vgshr@veritasdgc.com
WEB: http://www.veritasdgc.com

APPLICATION SYSTEM SUPPORT ENGINEERS-MT/WS/397

Job Location: United Kingdom, Edinburgh (Plus offshore Visits)

Job Status: Permanent
Start Date: ASAP
Interview Date: ASAP
Open To: EU Citizen

Job Overview: An advanced IT solutions Company providing leading products and services for the oil exploration and production industry are expanding and seek a number of Application System Support Engineers.

This established company is a world leader in the supply of real time navigation and positioning systems and offer an integrated family of products addressing the navigation and data management requirements of 2D, 3D and 4D seismic surveys in towed streamer and seabed operations. They have earned an international reputation for anticipating customer needs and providing tools which deliver dramatic efficiency improvements and operational cost savings in the highly competitive seismic acquisition market.

In addition, they offer oil companies and seismic acquisition contractors a comprehensive range of geophysical services delivered by expert personnel and backed up by an extensive library of software tools and sophisticated web based delivery mechanisms.

Working along side more senior engineers, your primary responsibility is to provide office based support including system testing, client training and application support of the Company's navigation, surveying & data processing products.

For approximately 100 days a year you will be expected to be in the field (i.e. offshore on a crew vessel) where you will install and support these products. You will liaise with the client and crew members, ensuring systems are operable, queries are resolved or reported and that overall a high level of satisfaction is maintained. These vessels may be based in West Africa, Gulf of Mexico, Brazil, India, Far East etc. so there is a great opportunity to travel. The Company will make all arrangements from and to your base location and the vessel.

Primary Responsibilities:
- Reporting to the Support Manager, this role encompasses the following office functions:
- Attend to incoming support queries relating to the use of the company's software. You will provide advice and guidance to resolve simple and complex problems.
- Assist & co-ordinate testing of all software & hardware as required.
- Co-ordinate & conduct client training including preparation of documentation and system set-up.
- Assist with updating manuals, documentation & procedures where directed by the Support Manager
- Assist with day-to-day running of the department including preparation of shipments as required.
- Supervise & assist junior engineers when necessary.
- Work with other team players with regard to co-ordinate the 24 support rota.

This is a great opportunity for a dynamic self-motivated individual who has strong IT skills and who enjoys travelling. The Company recognise that you may not be familiar with their industry or software solutions and are committed to training the successful candidate.

Preferences: The successful candidate will have:
- Degree or HND in an engineering or numerate subject (e.g. engineering, mathematics, physics, computer science, hydrographic surveying or similar.)
- Minimum of 2 years work experience essential, preferably in the oil and gas industry.
- Some experience of providing software application support or application training essential.
- Good understanding or work experience of computer networks and infrastructure essential.
- Good general IT skills, some experience of installing software essential, preferably on a Linux environment.
- Good basis PC system administration skills essential.
- Experience using Microsoft Office applications essential.
- A knowledge of seismic acquisition techniques including navigation, positioning and/or navigation data processing, highly advantageous.
- Excellent communication skills (both written and spoken). Good client liaison skills, as you will be dealing with clients on a regular basis.
- Must be self-motivated and able to work unsupervised.
- Must be able to work for periods away from home and in an offshore environment.
- You must be a team player who enjoys the interaction with clients
- Service orientated.
- Willingness to learn, flexibility and desire to undertake the role and succeed.
- Must be willing and able to travel

Package: A remuneration package circa £30K-£36K plus company benefits is on offer dependent on skills and experience. The package is made up of a base salary and an attractive offshore day rate.

Applications for this job are only accepted via www.working-smart.co.uk. To apply go to the Web Site, Select 'Candidates' 'Review Jobs'. Please ensure you upload a current copy of your CV and we advise you also include a Cover Note supporting your application.

Tracy Barratt
Working Smart Limited
PetroTech House, Francis Place
Pirbright, Surrey GU24 0JU
United Kingdom

Phone: +44(0)1483 481141
Fax: +44(0)1483 799738
Email: info@working-smart.co.uk
WEB: http://www.working-smart.co.uk

SENIOR SYSTEM SUPPORT ENGINEERS - MT/WS/398

Job Location: United Kingdom, Edinburgh (Plus offshore Visits)

Job Status: Permanent
Start Date: ASAP
Interview Date: ASAP

Open To: EU Citizen

Job Overview: An advanced IT solutions Company providing leading products and services for the oil exploration and production industry are expanding and seek a number of Senior System Support Engineers.

This established company is a world leader in the supply of real time navigation and positioning systems and offer an integrated family of products addressing the navigation and data management requirements of 2D, 3D and 4D seismic surveys in towed streamer and seabed operations. They have earned an international reputation for anticipating customer needs and providing tools which deliver dramatic efficiency improvements and operational cost savings in the highly competitive seismic acquisition market.

In addition, they offer oil companies and seismic acquisition contractors a comprehensive range of geophysical services delivered by expert personnel and backed up by an extensive library of software tools and sophisticated web based delivery mechanisms.

As an experienced IT systems engineer, your primary responsibility is to provide office based support including system testing, client training and application support of the Company's navigation, surveying & data processing products.

For approximately 100 days a year you will

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be expected to be in the field (i.e. offshore on a crew vessel) where you will install and support these products. You will liaise with the client and crew members, ensuring systems are operable, queries are resolved or reported and that overall a high level of satisfaction is maintained. These vessels may be based in West Africa, Gulf of Mexico, Brazil, India, Far East etc. so there is a great opportunity to travel. The Company will make all arrangements from and to your base location and the vessel.

Primary Responsibilities: Reporting to the Support Manager, this role encompasses the following office functions:

- Attend to incoming support queries relating to the use of the company's software. You will provide advice and guidance to resolve simple and complex problems.
- Assist & co-ordinate testing of all software & hardware as required.
- Co-ordinate & conduct client training including preparation of documentation and system set-up.
- Assist with updating manuals, documentation & procedures where directed by the Support Manager
- Assist with day-to-day running of the department including preparation of shipments as required.
- Supervise & assist junior engineers when necessary.
- Work with other team players with regard to co-ordinate the 24 support rota.
- You will assist in mentoring more junior support personnel.

It is expected that you will be conversant with all the technical system skills required to do the job however you will be proactive in acquiring further knowledge developing expertise accordingly.

This is a great opportunity for a dynamic self-motivated individual who has strong IT skills and who enjoys travelling. The Company recognise that you may not be familiar with their industry or software solutions and are committed to training the successful candidates.

Preferences: The successful candidate will have:

- Degree or HND in an engineering or numerate subject (e.g. engineering, mathematics, physics, computer science, hydrographic surveying or similar.)
- Minimum of 5 years work experience essential, preferably in the oil and gas industry.
- Good general IT skills - proven experience of installing technical software on a Linux environment essential.
- Proven experience of computer networks and infrastructure and the ability to resolve related problems essential.
- Proven PC system administration skills essential
- Proven experience of providing software application support essential.
- Training experience advantageous.
- Experience using Microsoft Office applications essential.
- A knowledge of seismic acquisition techniques including navigation, positioning and/or navigation data processing, highly advantageous.
- Excellent communication skills (both written and spoken). Good client liaison skills, as you will be dealing with clients on a regular basis.
- Must be self-motivated and able to work unsupervised.
- Must be able to work for periods away from home and in an offshore environment.
- You must be a team player who enjoys the interaction with clients
- Service orientated.
- Willingness to learn, flexibility and desire to undertake the role and succeed.
- Must be willing and able to travel

Package: A remuneration package of £36K-£40K plus company benefits is on offer dependent on skills and experience. The package is made up of onshore plus offshore day rates.

Applications for this job are only accepted via www.working-smart.co.uk. To apply go to the Web Site, Select 'Candidates' 'Review Jobs'. Please ensure you upload a current copy of your CV and we advise you also include a Cover Note supporting your application.

Tracy Barratt
Working Smart Ltd
PetroTech House, Francis Place
Pirbright, Surrey GU24 0JU
United Kingdom

Phone: +44(0)1483481141
Fax: +44(0)1483799738
Email: info@working-smart.co.uk
WEB: http://www.working-smart.co.uk

OFFSHORE SYSTEM SUPPORT ENGINEER -MT/WS/399

Job Location: United Kingdom, World Wide - Offshore Crews (UK Office)

Job Status: Permanent
Start Date: ASAP
Interview Date: ASAP
Open To: EU Citizen

Job Overview: An advanced IT solutions Company providing leading products and services for the oil exploration and production industry are expanding and seek a Offshore System Support Engineer.

This established company is a world leader in the supply of real time navigation and positioning systems and offer an integrated family of products addressing the navigation and data management requirements of 2D, 3D and 4D seismic surveys in towed streamer and seabed operations. They have earned an international reputation for anticipating customer needs and providing tools which deliver dramatic efficiency improvements and operational cost savings in the highly competitive seismic acquisition market.

In addition, they offer oil companies and seismic acquisition contractors a comprehensive range of geophysical services delivered by expert personnel and backed up by an extensive library of software tools and sophisticated web based delivery mechanisms.

You will work offshore on a seismic crew vessel for circa 150 days per annum for periods of approximately 1-6 weeks at a time. Your primary responsibility is to install, commission and support navigation, surveying & data processing products worldwide.

You will liaise with the client and crew members, ensuring systems are operable, queries are resolved or reported and that overall a high level of satisfaction is maintained. These vessels may be based in West Africa, Gulf of Mexico, Brazil, India, Far East etc. so there is a great opportunity to travel. When not offshore, you will make some visits to the Company's UK-Edinburgh for training, staff meeting and general operations. The Company will make all arrangements from and to your base location and the vessel.

Primary Responsibilities: Reporting to the Support Manager and the Crew Manager, this role encompasses the following offshore functions:

- Installation of the Company's navigation, surveying & data processing products on a Linux PC environment.
- Test and ensure that products are fully functional with other devices and networks. Sign off on their operability.
- Maintain these systems whilst on the vessel.
- Working in a consultative mode, provide operational support of installed systems to crew members, offering advice and guidance in their use.
- Troubleshoot problems, resolve & report appropriately.
- Liaise with clients and strive to achieve a high level of customer satisfaction.
- Work with other team players in delivering a coherent service.

This is a great opportunity for a dynamic self-motivated individual who has some experience in marine seismic operations as a navigator/surveyor or field engineer, good IT skills and who enjoys travelling. The Company recognise that you may not be familiar with their software solutions and are committed to training the successful candidate.

Preferences: The successful candidate will have:

- Degree or HND in an engineering or numerate subject (e.g. engineering, mathematics, physics, computer science, hydrographic surveying or similar.)
- Minimum of 2 years work experience in the offshore marine industry essential.
- Previous experience working offshore on vessels essential.
- Proven work experience in one or more of the following areas essential: seismic acquisition techniques including navigation, positioning and/or navigation data processing, installation of pipelines, calibration, rig moves/placements, or related functions.
- Some experience working with or supporting a leading navigation or positioning software product essential (e.g. Sprint, Spectra, Gator, Reflex, or other equivalent integrated navigation system).
- Good general IT skills, some experience of installing software essential, preferably on a Linux environment.
- Some experience of providing software application support or application training essential.
- Good understanding or work experience of computer networks and infrastructure essential.
- Some experience of providing software application support or application training essential.
- Good basis PC system administration skills essential.
- Experience using Microsoft Office applications essential.
- Excellent communication skills (both written and spoken).
- Must be self-motivated with the confidence and ability to work unsupervised in an offshore environment.
- Service orientated.
- Willingness to learn, flexibility and desire to undertake the role and succeed.
- Able to travel at short notice.

Package: A Day Rate Package circa £33K-£41K plus company benefits is on offer dependent on skills and experience. Potential to earn more if more than 150 days offshore.

Applications for this job are only accepted via www.working-smart.co.uk. To apply go to the Web Site, Select 'Candidates' 'Review Jobs'. Please ensure you upload a current copy of your CV and we advise you also include a Cover Note supporting your application.

Tracy Barratt
Working Smart Limited
PetroTech House, Francis Place
Pirbright, Surrey GU24 0JU
United Kingdom

Phone: +44(0)1483481141
Fax: +44(0)1483799738
Email: info@working-smart.co.uk
WEB: http://www.working-smart.co.uk

SENIOR OFFSHORE SYSTEM SUPPORT ENGINEER -MT/WS/400

Job Location: United Kingdom, World Wide - Offshore Crews (UK Office)

Job Status: Permanent
Start Date: ASAP
Interview Date: ASAP
Open To: EU Citizen

Job Overview: An advanced IT solutions Company providing leading products and services for the oil exploration and production industry are expanding and seek a Senior Offshore System Support Engineer.

This established company is a world leader in the supply of real time navigation and positioning systems and offer an integrated family of products addressing the navigation and data management requirements of 2D, 3D and 4D seismic surveys in towed streamer and seabed operations. They have earned an international reputation for anticipating customer needs and providing tools which deliver dramatic efficiency improvements and operational cost savings in the highly competitive seismic acquisition market.

In addition, they offer oil companies and seismic acquisition contractors a comprehensive range of geophysical services delivered by expert personnel and backed up by an extensive library of software tools and sophisticated web based delivery mechanisms.

You will work offshore on a seismic crew vessel circa 150 days per annum for periods of approximately 1-6 weeks at a time. As a senior engineer, your primary responsibility is to take charge of the installation, commissioning and support of the Company's navigation, surveying & data processing products on client vessels.

You will liaise with the client and crew members, ensuring systems are operable, queries are resolved or reported and that overall a high level of satisfaction is maintained.

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These vessels may be based in West Africa, Gulf of Mexico, Brazil, India, Far East etc. so there is a great opportunity to travel. When not offshore, you will make some visits to the Company's UK-Edinburgh for training, staff meeting and general operations. The Company will make all arrangements from and to your base location and the vessel.

Primary Responsibilities: Reporting to the Support Manager and the Crew Manager, this role encompasses the following offshore functions:
· Installation of the Company's navigation, surveying & data processing products on a Linux PC environment.
· Test and ensure that products are fully functional with other devices and networks. Sign off on their operability.
· Maintain these systems whilst on the vessel.
· Working in a consultative mode, provide operational support of installed systems to crew members, offering advice and guidance in their use.
· Troubleshoot problems, resolve & report appropriately.
· Liaise with clients and strive to achieve a high level of customer satisfaction.
· Work with other team players in delivering a coherent service.
· You will support, train and mentor more junior staff in this role.

This is a great opportunity for a dynamic self-motivated individual who has proven experience in marine seismic operations as a navigator/surveyor or field engineer, good IT skills and who enjoys travelling. The Company recognise that you may not be familiar with their specific software solutions and training will be provided as required.

Preferences: The successful candidate will have:
· Degree or HND in an engineering or numerate subject (e.g. engineering, mathematics, physics, computer science, hydrographic surveying or similar.)
· Minimum of 5 years work experience in a marine industry essential.
· Previous experience working on offshore vessels essential.
· Proven experience working with or supporting a leading navigation or positioning software product essential (e.g. Sprint, Spectra, Gator, Reflex, or other equivalent integrated navigation system).
· Experience in land or marine seismic operations as a navigator/surveyor or field engineer desirable.
· Previous experience in one or more of the following essential: seismic acquisition techniques including navigation, positioning and/or navigation data processing, installation of pipelines, calibration, rig moves/placements, or related functions.
· Strong IT skills, with proven experience of installing software on a Linux environment essential.
· Practical work experience of computer networks and infrastructure essential.
· Experience in providing software application support essential.
· Strong PC system administration skills essential.
· Experience using Microsoft Office applications essential.
· Excellent communication skills (both written and spoken).
· Must be self-motivated with the confidence and ability to work unsupervised and take charge of your functions in an offshore environment.
· Service orientated.
· Willingness to learn, flexibility and desire to undertake the role and succeed.
· Able to travel at short notice.

Package: A Day Rate Package circa £34K-£46K plus company benefits is on offer dependent on skills and experience. Potential to earn higher if more than 150 days offshore.

Applications for this job are only accepted via www.working-smart.co.uk. To apply go to the Web Site, Select 'Candidates' 'Review Jobs'. Please ensure you upload a current copy of your CV and we advise you also include a Cover Note supporting your application.

Tracy Barratt
Working Smart Ltd
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Phone: +44(0)148348114
Fax: +44(0)1483799738
Email: info@working-smart.co.uk
WEB: http://www.working-smart.co.uk

NAVAL POWER SYSTEMS ARCHITECT/ENGINEER

Job Location: USA, RI

Work with subcontractor to abide by Naval Vessell Regulations (NVR).
Previous experience designing, building and testing advanced shipboard power distribution systems.

Peter Sison
Lighthouse Placement Services
34 Rogers Road
Bradford, MA 01835
USA

Phone: 978-373-2095
Fax: 978-345-6574
Email: pgsison@lighthouseplacement.com
WEB: http://www.lighthouseplacement.com

SCIENTIST, FISHERIES BIOLOGIST, OCEANOGRAPHER

Job Location: USA, WA Seattle

Responsible for conducting acoustic tag and hydroacoustic fisheries studies, incl. deployment, data collection & analysis, reporting. Supervise personnel. BA in Sciences. May require travel typically in WA, OR, AK, the East Coast, Canada, Europe and other locations. Most field work for 1-4 wk at a time, 1-2 times/year. Resume to support@HTIsonar.com. www.HTIsonar.com. No calls please. EOE
, WA USA

Email: support@HTIsonar.com
WEB: http://www.HTIsonar.com

DATABASE MANAGER / DATA ANALYST

Job Location: USA, WA seattle

Responsible for varied fisheries research studies using state-of-the-art acoustic tag tracking and hydroacoustic (sonar) systems, incl. deployment, testing, data collection & analysis, and interpretation. Supervise personnel. BA in Sciences. May require travel typically in WA, OR, AK, the East Coast, Canada, Europe & other locations. Most field work for 1-4 wk at a time, 1-2 times/year. Resume to support@HTIsonar.com. www.HTIsonar.com. No calls please. EOE
Seattle, WA

Email: support@HTIsonar.com
WEB: http://www.HTIsonar.com

SALES MANAGER - HOUSTON

Job Location: USA,

IXSEA Inc. is currently seeking several energetic individuals to contribute to sales growth in of their inertial, acoustics-based navigation and positioning and imagery product lines (software and hardware) in the USA and South America.

They will be expected to perform direct sales as well as to manage the sales distribution network over several regional areas.
Positions require a strong background in either the offshore Oil and Gas or the hydrography markets. A good knowledge of acoustics or inertial is welcome.

The ideal candidate will have a good understanding of the marketplace. A proven history in strong written and personal communication skills is required with a previous sales experience. Salary is commensurate with experience.

For a comprehensive description of the product lines of the company, visit www.ixsea.com. Please email details to info@iXSEA.COM

stephane Loeul
iXSEA Inc

Email: stephane.loeul@ixsea.com
WEB: http://ww.ixsea.com

SOFTWARE ENGINEER

Job Location: United Kingdom, Edinburgh

Applications are invited from qualified candidates for the position of Software Engineer. Our core technologies involve intelligent systems for autonomous or remote platforms and processes. The successful candidate will work, under the guidance of the Product Manager, on the development of SeeByte's flagship product SeeTrack, a mission planning, monitoring, sensor fusion and visualisation platform for Unmanned Underwater Vehicles.

1. Essential Qualifications:
- Expertise in C/C++, JAVA and Visual Basic.
- Expertise in Microsoft Visual Studio 6.0 and .NET.
- Expertise in SQL and Microsoft Access.
- Expertise in COM components.
- At least 1 year's experience.
- A Bachelors Degree (1ST/2.1 Hons) in Software Engineering or Computer Science.
- Good written and briefing skills in English.

2. Desirable Qualifications:
- Expertise in OpenGIS, OpenCV and ESRI Software.
- Knowledge of PostgreSQL.
- Knowledge of Matlab.
- Knowledge of UNIX and Linux.
- Experience with embedded software.
- Experience with CVS.
- At least 3 years' experience.
- A Masters Degree in Software Engineering or Computer Science.

3. Personal Attributes:
The candidate should have the ability to produce quality, well commented source code to meet specifications and requirements set out by the product manager; good organisation skills; and be able to work with colleagues and other staff. The candidate must be able to adapt and be self-motivated. Travel may be a requirement of the position.

4. Salary:
The salary will be between £18k and £25k depending on experience and training.

5. Closing Date:
Suitable qualified candidates should submit a cover letter, C.V. and the name of three referees (including e-mail addresses and phone numbers) by the 1st of December 2005.

6. Start Date:
4th of January 2006.

Personnel Office
SeeByte Ltd.
Canaan Court
6A Canaan Lane
Edinburgh EH10 4SY
Scotland, UK

Personnel Office
SeeByte Ltd
Canaan Court
6a Canaan Lane
Edinburgh, EH10 4SY
United Kingdom

Email: juliet.grant@seebyte.com
WEB: http://www.seebyte.com

SALES MANAGER - BOSTON

Job Location: USA,

IXSEA Inc. is currently seeking several energetic individuals to contribute to sales growth in of their inertial, acoustics-based navigation and positioning and imagery product lines (software and hardware) in the USA and South America.

They will be expected to perform direct sales as well as to manage the sales distribution network over several regional areas.
Positions require a strong background in either the offshore Oil and Gas or the hydrography markets. A good knowledge of acoustics or inertial is welcome.

The ideal candidate will have a good understanding of the marketplace. A proven history in strong written and personal communication skills is required with a previous sales experience. Salary is commensurate with experience.

For a comprehensive description of the product lines of the company, visit www.ixsea.com. Please email details to info@iXSEA.COM

stephane Loeul iXSEA Inc

Email: stephane.loeul@ixsea.com
WEB: http://www.ixsea.com

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TECHNICAL SALES MANAGER - FIBER OPTIC GYROSCOPES

Job Location: USA, RI Middletown

POSITION: TECHNICAL SALES MANAGER - Fiber Optic Gyroscope (FOG) & OEM

COMPANY INFORMATION:
KVH Industries, Inc. (www.kvh.com) designs and manufactures products that enable mobile satellite communications, navigation, and precision pointing through the use of its proprietary mobile satellite antenna and fiber optic technologies. This growing, $70M company is developing next-generation systems with greater precision, durability, and versatility for communications, navigation, and industrial applications. An ISO 9001-certified company, KVH has headquarters in Middletown, Rhode Island, with a manufacturing facility in Tinley Park, Illinois for the FOG and military navigation product lines. A European sales, marketing, and support office is located in Kokkedal, Denmark.
KVH Industries is currently seeking an outstanding technical sales professional to lead major sales efforts primarily within the DoD for their line of Fiber Optic Gyroscopes, (FOG). This individual, armed with an understanding of the FOG's capabilities and its potential uses, (gun/turret stabilization, antenna/radar/optics stabilization, IMUs, GPS/INS, AHRS, industrial robotics/autonomous vehicles, UAV/ROV guidance, flight controls, GPS augmentation and marine motion sensing), will conduct presentations to DoD customers and Defense prime contractors in order to expand the markets and applications currently addressed by the KVH FOG product line. This individual will be responsible for working with customers from requirements needs-analysis and definition through negotiations and contract administration.

RESPONSIBILITIES:
- Visit potential customer sites to deliver FOG presentations and determine customer needs.
- Work with the customer to develop requirements assessments.
- Travel both domestically (primarily) and internationally to support key FOG initiatives.
- Develop and manage large volume, multi-year FOG sales programs with prime contractors.
- Act as the applications specialist for the FOG product and sales program.
- Manage and support the sales representative network.
- Write and edit proposals for new contracts.
- Negotiate terms and conditions for new contracts.
- Coordinate with Sales admin & legal staff regarding export licensing for international sales.

QUALIFICATIONS:
- SEE or a BS with strong electronics/engineering background.
- 6-10 years of proven sales,sales application support, program marketing/management or business development experience, preferably in military, aerospace or hi-reliability markets.
- Ability to quickly grasp technical details and working knowledge of complex systems.
- High level of customer focus.
- Excellent program management and negotiation skills, preferably in an extended sales cycle environment.
- Detail-oriented and accurate individual who is able to set and keep priorities.
- Excellent presentation, verbal and written communication skills.
- Solid knowledge and proficiency in project management tools, processes and procedures.
- Located in Middletown, RI, with ability to travel 35-40%

CONTACT:
Ted Furtado, CPC, Vice President
Management Search Inc.
KVH Industries
E-Mail: tfurtado@ri.msi1.com

NAVAL ARCHITECTS, SALVAGE ENGINEERS

Job Location: USA, CT Groton

JMS Naval Architects & Salvage Engineers has immediate openings for Naval Architect/Salvage Engineers and a Junior Naval Architects.

Naval Architect/Salvage Engineers:
Successful candidate will be responsible for providing naval architecture, salvage engineering, and marine engineering support for commercial vessels such as tugs, tank barges, research vessels, dive vessels, and pilot boats. Assigned tasks will include:

- Conducting intact and damaged stability analyses
- Conducting structural assessments using first principles methods and finite element analysis
- Designing marine engineering systems
- Conducting ship checks/surveys
- Performing deadweight surveys and inclining experiments
- Conducting damage assessments and developing repair plans
- Developing shipyard work specifications
- Conducting rule analyses using classification society standards and/or USCG regulations
- Utilizing HECSALV, AutoCAD, Rhino, and Algor software

The position requires an engineering degree in the marine field. A graduate degree in naval architecture or an undergraduate naval architecture degree with prior experience or PE is preferred. Candidates should have familiarity with classification society standards, USCG regulations, and vessel design and construction principles. Shipboard experience is highly desirable.

Interested individuals should send a resume with cover letter to hr@jmsnet.com. The cover letter should concisely describe experience related to the task description above and salary history.

Junior Naval Architects:
Successful candidate will be responsible for providing design, naval architecture, salvage engineering, and marine engineering support for commercial vessels such as tugs, tank barges, research vessels, dive vessels, and pilot boats. Assigned tasks will include:

- Conducting intact and damaged stability analyses
- Conducting structural assessments using first principles methods and finite element analysis
- Designing marine engineering systems
- Conducting rule analyses using classification society standards and/or USCG regulations
- Producing detailed design drawings
- Utilizing HECSALV, AutoCAD, Rhino, and Algor software

The position requires an engineering degree in the marine field. Previous design experience and strong CAD skills are necessary. Candidates should have familiarity with classification society standards, USCG regulations, and vessel design and construction principles. Previous shipboard experience is also highly desirable.

Interested individuals should send a resume with cover letter to hr@jmsnet.com. The cover letter should concisely describe experience related to the task description above and salary history.

Human Resources
JMS Naval Architects & Salvage Engineers
1084 Shennecossett Rd
Groton, CT 06340
USA

Phone: 860-448-4850
Email: hr@jmsnet.com
WEB: http://www.jmsnet.com

OCEANOGRAPHIC FIELD TECHNICIAN

Job Location: USA, TX Houston

Fugro GEOS is the world's foremost provider of commercial oceanographic measurement, assessment and consulting services, with offices in the US, UK, Norway, Malaysia, UAE and Singapore. The Company is part of the multi-national Fugro Group that provides a complete range of integrated geotechnical, environmental, survey and positioning services world-wide. To meet the demands of our rapid market expansion throughout the Americas, we are seeking to employ the following high caliber staff members to be based in Houston:

OCEANOGRAPHIC FIELD TECHNICIAN
The chosen individual will be a core member of our operational team that has an excellent reputation for the provision of reliable and accurate oceanographic measurement services. The role will involve a number of key activities including:

· The deployment, recovery, and servicing of oceanographic measurement instrumentation.
· The installation and maintenance of real-time measurement systems and their associated deployment systems.
· The maintenance of accurate and detailed instrument service records, trip reports, and logs.

The ideal candidate will be:

· Experienced in testing, installation, and data handling of real-time serial and analog data acquisition systems.
· Experienced in servicing and maintaining marine scientific equipment or similar devices.
· Prepared to travel both domestically and internationally and to work aboard offshore vessels and installations.
· Willing to work a flexible call-out schedule involving 150 - 250 field days per year with time off between jobs.
· Attentive to details and able to work independently in the field.

In return Fugro GEOS offers a dynamic team based, working environment in an exciting and developing market, as well as the long-term potential for you to develop your skills and career. Compensation will be commensurate with qualifications and experience and includes a full benefits package. EOE. If you are up to the challenge please fax resume to (713) 346-3605, e-mail to geosus@geos.com or mail to Fugro GEOS, Inc., P.O. Box 740010, Houston, TX 77274. Deadline for application 25 November 2005.

Jan van Smirren
Fugro GEOS Inc.
6100 Hillcroft
Houston, TX 77081
USA

Phone: 713-346-3611
Email: smirren@geos.com
WEB: http://www.geos.com

OCEANOGRAPHIC ENGINEER

Job Location: USA, TX Houston

Fugro GEOS is the world's foremost provider of commercial oceanographic measurement, assessment and consulting services, with offices in the US, UK, Norway, Malaysia, UAE and Singapore. The Company is part of the multi-national Fugro Group that provides a complete range of integrated geotechnical, environmental, survey and positioning services world-wide. To meet the demands of our rapid market expansion throughout the Americas, we are seeking to employ the following high caliber staff members to be based in Houston:

OCEANOGRAPHIC ENGINEER
The chosen individual will be a core member of our operational team that has an excellent reputation for the provision of reliable and accurate oceanographic systems. The role will involve a number of key activities including:

· The design and specifications of metocean data acquisition systems, including custom systems integration.
· Documentation of Systems including maintenance of accurate and detailed records pertaining to the system, instrumentation and offshore reports
· Development of Acceptance Testing Procedures and Implementation
· Offshore installation, servicing and maintenance of systems.

The ideal candidate will be:

· Educated in electronics, with experience in design and building of metocean systems.
· Prepared to travel both and internationally, with experience of working in the offshore environment both aboard vessels and fixed installations.
· Attentive to detail

For information on posting a job on these pages and on the "JOBS" site at www.seadiscovery.com, contact Dale Barnett at tel: 212-477-6700; fax: 212-254-6271; or e-mail: barnett@marinelink.com

· Be able to work independently or as part of a team on a wide range of projects
· Have excellent written and oral communication skills in English
· Familiar with AutoCAD

In return Fugro GEOS offers a dynamic team based, working environment in an exciting and developing market, as well as the long-term potential for you to develop your skills and career. Compensation will be commensurate with qualifications and experience and includes a full benefits package. EOE. If you are up to the challenge please fax resume to (713) 346-3605, e-mail to geosus@geos.com or mail to Fugro GEOS, Inc., P.O. Box 740010, Houston, TX 77274. Deadline for application 25 November 2005.

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Houston, TX 77081
USA

Phone: 713-346-3611
Email: smirren@geos.com
WEB: http://www.geos.com

OCEANOGRAPHIC CONSULTANT

Job Location: USA, TX Houston

Fugro GEOS is the world's foremost provider of commercial oceanographic measurement, assessment and consulting services, with offices in the US, UK, Norway, Malaysia, UAE and Singapore. The Company is part of the multi-national Fugro Group that provides a complete range of integrated geotechnical, environmental, survey and positioning services world-wide. To meet the demands of our rapid market expansion throughout the Americas, we are seeking to employ the following high caliber staff members to be based in Houston:

OCEANOGRAPHER - CONSULTANCY DIVISION
The chosen individual will be a core member of our consultancy team that has an excellent reputation for the provision of meteorological and oceanographic consultancy. The role will involve a number of key activities including:

· The preparation of operational and design criteria reports for the Gulf of Mexico and worldwide.
· Physical oceanographic and meteorological data processing, analysis and report writing.
· Project management.

The ideal candidates will demonstrate the following attributes:

· Educated in marine science with interest/experience in all aspects of physical oceanographic data analysis.
· Familiar with metocean criteria preparation.
· Highly resourceful and PC literate with strong problem solving instincts and close attention to detail.
· Experienced in use of Matlab
· Knowledgeable of the current processes that occur in the Gulf of Mexico.
· Commercial awareness.

In return Fugro GEOS offers a dynamic team based, working environment in an exciting and developing market, as well as the long-term potential for you to develop your skills and career. Compensation will be commensurate with qualifications and experience and includes a full benefits package. EOE. If you are up to the challenge please fax resume to (713) 346-3605, e-mail to geosus@geos.com or mail to Fugro GEOS, Inc., P.O. Box 740010, Houston, TX 77274. Deadline for application 25 November 2005.

Jan van Smirren
Fugro GEOS Inc.
6100 Hillcroft
Houston, TX 77081
USA

Phone: 713-346-3611
Email: smirren@geos.com
WEB: http://www.geos.com

SHIP ENGINEER, MOTOR & STEAM

Job Location: USA, NC South Eastern USA

Ship Engineer, Motor & Steam

Posting is via Maritime Recruiters
Interested Applicants
For More Info Contact:
Maritime Recruiters

CONTACT INFO:
Email resume to:
bob@maritimerecruiters.com
or
FAX Resume's: (206) 232-6041
(Resumes 2 pages maximum)

bob@maritimerecruiters.com
Maritime Recruiters
Mercer Island, WA 98101
USA

Phone: (206) 232-6041
Fax: (206) 232-6041
Email: bob@maritimerecruiters.com
WEB: http://www.maritimerecruiters.com

DRAFTSMANS AND NAVAL ARCHITECT

Job Location: United Arab Emirates, Dubai

Exomos is looking for its design department several draftsmen and one naval architect to work on new designs and existing hulls. Drawing, drafting, 3D, CAD, hull resistance and speed predictions.

Herve Jaubert
Exomos
Jebel Ali Free zone
Dubai, Dubai 18681
United Arab Emirates

Phone: 971 488 35222
Fax: 971 488 35228
Email: hjaubert@emirates.net.ae
WEB: http://www.exomos.com

WIG ENGINEER

Job Location: United Arab Emirates, Dubai

To design,develop and build commercial wing in ground effect hovercrafts and vessels.

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CHIEF MECHANICAL ENGINEER

Job Location: USA, WA Redmond

Sound Ocean Systems, Inc. (SOSI) is a leading and innovative manufacturer of specialized marine equipment and related engineering and design services. Our hardware products range from shipboard equipment such as winches and handling systems, in-water systems such as towed bodies, oceanographic data buoys and bottom platforms, to marine mining and other deep water systems capable of operating in 6,000 meters of water. Our engineering services related products include feasibility studies, conceptual design, detail design, engineering and project management services. We have an immediate opening for an experienced chief mechanical engineer.

This is an excellent opportunity for an individual with the right skills. We are looking for someone with ten or more years experience in the engineering and design development, manufacture, and test of marine equipment similar or comparable to SOSI's existing products. Additionally, experience with industrial field fabrication will be beneficial. The applicant must possess good communications skills and be capable of not only working independently with minimum supervision, but must be able to effectively manage the company's small engineering and design team. The candidate must be detail oriented, a team player, a motivated self-starter, and have a BS or advanced degree in mechanical engineering. A Professional Engineering license in the State of Washington is highly desirable. Extensive experience in AutoCAD and Inventor software is required as is experience with Microsoft office products.

The successful candidate will be hired as the Engineering Design Manager & Chief Engineer of the company. As such, the successful candidate will be responsible for all engineering and design activities of the company including the day to day management, allocation and direction of the company's internal and external engineering and design resources. The Chief Engineer will be responsible for implementing the Configuration Management and other engineering and design related processes of the company. The Chief Engineer will assist estimating, project management and sales efforts by providing estimates of engineering labor hours and timelines for new product development and other required engineering activities.

Ted Brockett
Sound Ocean Systems, Inc.
P.O. Box 2978
Redmond, WA 98075
USA

Phone: 425-869-1834
Fax: 425-869-5554
Email: ted@soundocean.com
WEB: http://www.soundocean.com

INSTRUMENT TECHNICIAN

Job Location: USA, LA Cocodrie

The Louisiana Universities Marine Consortium (LUMCON) has an opening for an Instrument Technician to maintain and assist in the deployment of a growing system of coastal monitoring stations. See http://weather.lumcon.edu/.

Each station has weather and water property sensors, and a data gathering communications package for sending information to the LUMCON Marine Center. The LUMCON Coastal Monitoring Technician is responsible for all aspects of station design, parts procurement and inventory, fabrication, testing, installation and trouble shooting at all LUMCON Coastal Monitoring Stations, and regular cleaning, calibration and maintenance of the station instrumentation. Responsibilities also include maintaining accurate and detailed metadata records for all actions pertaining to the stations and instrumentation, and working with LUMCON IT personnel to upgrade the web-based data display protocol. The Instrument Technician will participate in the planning and installation of new stations, and establish maintenance schedules for all stations under the supervision of the Director for Operations and Facilities.

A bachelor's or master's degree in an Earth Sciences program and experience with field instrumentation is recommended.

Specific skills include the ability to maintain and troubleshoot analog and digital electronic instrumentation systems, batteries, solar arrays, and rf modem communication systems. Familiarity and demonstrated proficiency with Campbell Scientific Loggernet software, Campbell Scientific dataloggers, Microsoft Windows 2000 operating system, serial and TCP/IP communication protocols, radio communication hardware interfaces, and Microsoft Excel or similar data manipulation/visualization software, along with field experience and small boat handling capabilities are desired.

Salary range commens

Brenda Leroux Babin
LUMCON
8124 Highway 56
Chauvin, LA 70344

Phone: 985-851-2878
Fax: 985-851-2874
Email: bbabin@lumcon.edu
WEB: http://weather.lumcon.edu

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Feature: *AUVs • ROVs • UUVs*
Product: *Communication Equipment & Services*
Directory: *Oceanology International 2006: Preview and Exhibition Guide*

Feature: March 2006

"Tele-Presence" Technology

Dr. Robert Ballard

In the March 2006 edition, Dr. Robert Ballard and colleagues Dr. Steve Hammond and Dr. Larry Mayer author a feature article on a new exploratory paradigm based upon "tele-presence" technology, set to debut when NOAA's new ship of exploration, the Okeanos Explorer, begins it first mission in late 2007. The article divulges details on scientists' new capabilities to participate directly in deepsea expeditions from land via the innovative "Inner Space Center" that is being built on the University of Rhode Island's Graduate School of Oceanography's campus.

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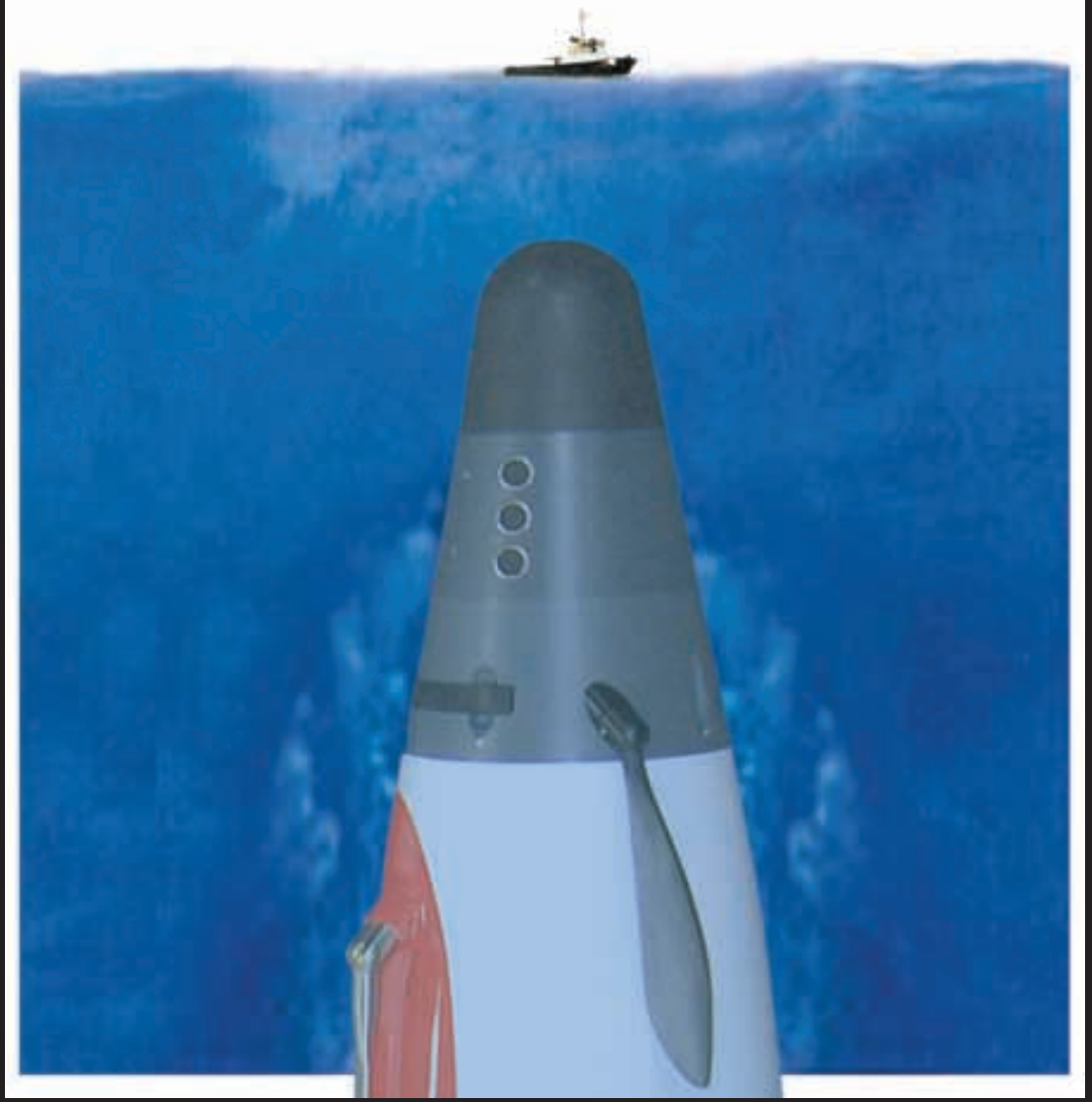

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