Obituary: Fred N. Spiess: Pioneer in Ocean Technology • OceanTech Expo 2007

MARINE TECHNOLOGY REPORTER

November 2006
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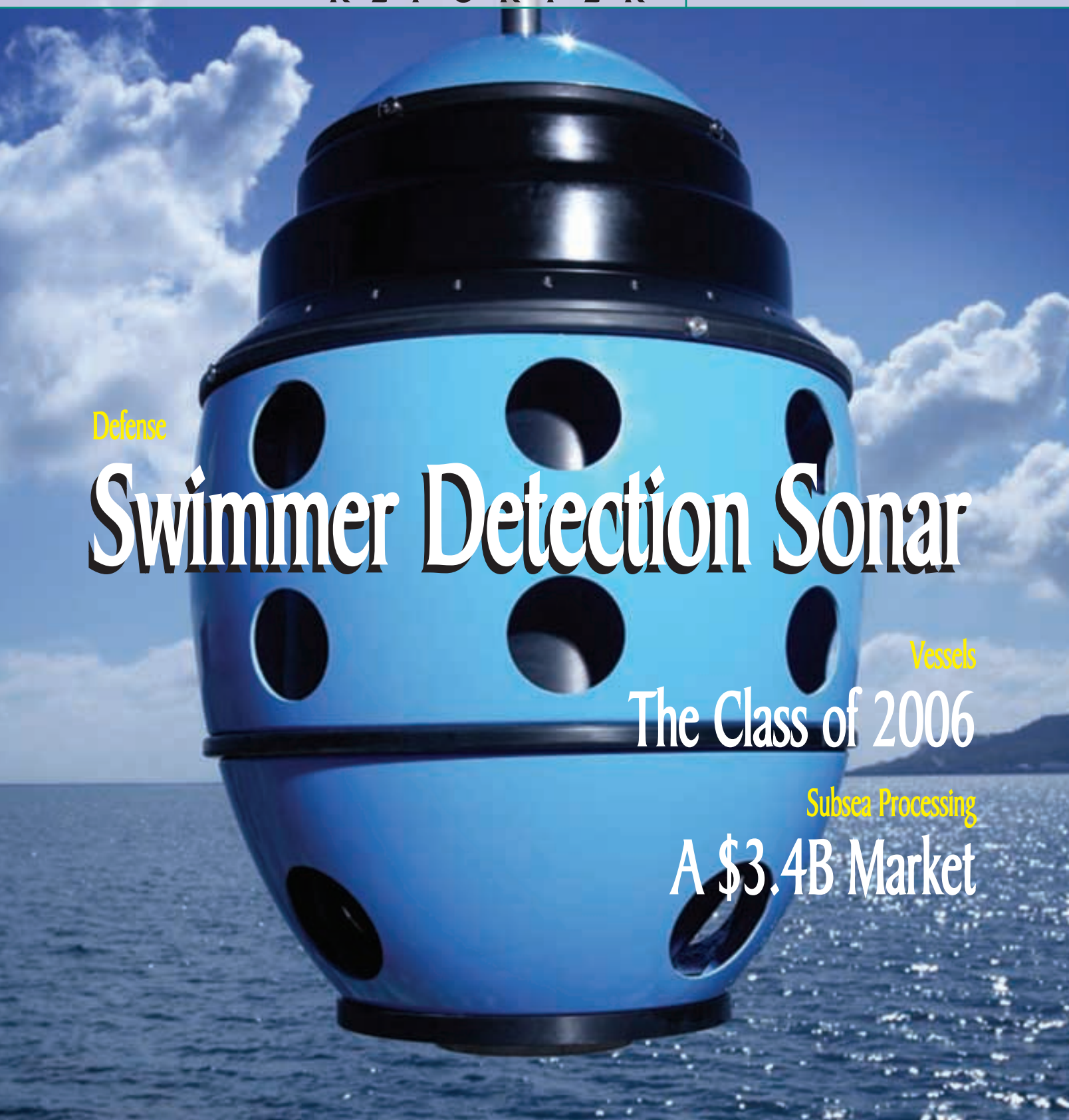

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THE NEXT WAVE

November 2006

contents

Marine Technology Reporter • Volume 49 • Number 9

Pictured in the background is the late WHOI Scientist Emeritus John H. Ryther, who passed away over the summer. Read about Ryther's career on page 53 of this edition.

on the Cover

Pictured on this month's cover is the Cerberus Wideband Swimmer Detection Sonar. Read about the system starting on page 34.

the Authors


Clarke


Stanhope


Webb


Minto

Tim Clarke is a Technical Leader in the QinetiQ Sonar Performance Group. He is a specialist in sonar design and performance with over 20 years experience in this field. Tim is responsible for the acoustic design and system performance of Cerberus. **Derek Stanhope** is the Technical Leader in the QinetiQ Underwater Countermeasures Group and the design authority for the Cerberus software. He has over 20 years experience of algorithm and software development related to underwater systems. **Andy Webb** is the Technical Leader for the QinetiQ Cerberus Programme and is Chief Engineer for the QinetiQ Underwater Security Group. He has worked in a variety of roles in the sonar field for over 30 years, and has particular interests in electronics and design of at sea systems. **Chris Minto** is the Business Development Manager for Cerberus and works in the QinetiQ Sales and Marketing Group. He has been involved with the Cerberus Project since its inception and deals with customer requirements and Cerberus solutions. **(Story on page 34)**

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. **(Story on page 29)**

also in this Edition

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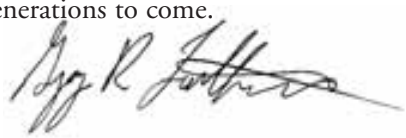
editorial

Sometimes it is difficult to cover this market and not get caught up in the 'gee whiz' factor. A seemingly infinite group of new products and systems stream to market, designed to explore and work below the water more effectively and efficiently. MTR regularly reports on these cutting edge undersea technologies and their application in science, commerce and defense.

However, the recent "GIS Day '06" hosted by the University of New Hampshire — an event that brought students, teachers and industry together to share information about the field of geographic information systems — in turn helps us to stay grounded.

The 8th Annual GIS day, as covered by Maggie Merrill starting on page 29, was focused on ocean mapping and exploration vehicle models. Without the marine element and the support of WHOI, NOAA and the UNH CCOM/JHC, this year's event would not have occurred.

Events such as this, which are held on the local, regional, national and international level, are critical to the long-term health and prosperity of this industry. Time, intelligence and monetary investment in these events will help to attract and cultivate the brilliant minds that will shape the industry for generations to come.



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Companies & People with editorial mention in this edition

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Dear Editor:

I was distressed by your recent article on our HROV project in the October edition of the MTR ("ROV Man," October 2006, page 30). There were many factual errors and omissions. While I cannot attempt to correct all of these here, I would like to address several I feel are particularly important.

To begin with, I have two co-Principal Investigators on this project who must be acknowledged: **Dr. Dana Yoerger** and **Professor Louis Whitcomb**. Dr. Yoerger is the longest standing member of WHOI's Deep Submergence Laboratory (DSL) and responsible for many of the early achievements relating to ROV control system development and deepwater acoustic navigation. His most notable achievement however must be development and utilization of the highly successful AUV ABE (Autonomous Benthic Explorer). On the HROV project, Dana brings not only his extensive understanding of navigation and control but also a high level of experience with AUVs operating in challenging deep ocean environments.

Professor Whitcomb, of Johns Hopkins University, with adjunct status at WHOI likewise has a long history with DSL, being the progenitor of both the Jason 1 and 2 vehicle control systems and the highly successful acoustic Doppler navigation package used by both Jason 2 and the submersible Alvin. On HROV, we would be seriously at disadvantage without Prof. Whitcomb's contributions to the understanding of the fiber tether through extensive modeling. Likewise, HROV would not benefit from his vast experience in control system development and implementation. It is also critically important to acknowledge the contributions that the **Navy's Space and Naval Warfare Center** in San Diego have made to the Project. Without the knowledge and assistance of **Barbara Fletcher**, **Chris Young**, **James Buescher** and **Richard Johnson**, the HROV concept would not be possible. Their lab has done ground-breaking research and development on both the fiber tether and ceramic materials that are being applied to this project. In addition to participation by these member of an active Navy Lab, we are and have been graced by having **Jerry Stachiw** on the team. Jerry's extensive knowledge of ceramics has been key to the use of this material on the HROV Nereus.

There are additional corrections I feel are important to point out at this time. First, was the apparent omission of a portion of the text that states who is funding this work.* Without the support of the **National Science Foundation**, **Office of Naval Research** and **National Oceanic and Atmospheric Administration**, this project would still remain as only a concept. For people who wish read more accurate information about HROV, I refer them to the WHOI website about the project **http://www.whoi.edu/sbl/liteSite.do?litesiteid=1810**.

There, readers will find a better technical description of the vehicle and links to other, more complete and accurate publications. Finally, I would like to emphasize that this project is a result of bring an exceptional team together. In addition to the players I have mentioned above, there is a large number of highly skilled and experienced people working hard to make HROV a success.

Andy Bowen
Research Specialist
Woods Hole Oceanographic Institution
Woods Hole, MA

*Editor's Note

Due to a pagination problem in the October edition, some text from Maggie Merrill's article — "ROV Man," October 2006, page 30 — was erroneously cut, for which we apologize. For more information on Nereus from WHOI's Oceanus magazine, please visit:
http://www.whoi.edu/oceanus/viewArticle.do?id=14107&sectionid=1002

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Hyundai Heavy Builds First Underwater LNG Tanks

The world's largest shipbuilder Hyundai Heavy Industries has built the world's first underwater liquefied natural gas tanks. Each is 155 m long and weighs 4,800 tons. The order was placed last year by ExxonMobil, and the tanks can store up to 260,000 cubic meters of liquefied natural gas (LNG). Hyundai declined to mention their cost.
The two tanks will be deployed in the Adriatic Sea off the coast of northern Italy to enter into use in 2008. Hyundai says the tanks can withstand temperatures of -162 degrees Celsius. The tanks will be delivered in pieces to Spain, where they will be assembled. (Source: http://english.chosun.com)

Subsea 7 Orders New DSV

Merwede Shipyard won a $200m contract for the design and construction of a new Diving Support/Offshore Construction vessel for Subsea 7. The introduction of this DSV to the market will provide Subsea 7 with a versatile and advanced vessel built to a high specification. The vessel is being built to fulfill the requirements of a contract obtained by Subsea 7 from Shell for diving support services in the North Sea. Delivery of the vessel is scheduled for the first quarter of 2009. The 24 man saturation dive spread will be designed and built by Divex.

Tsunami Warning System to be Completed by Sept. '07

Work on installing a tsunami warning system along the Indian coast was progressing fast and was likely to be completed by September 2007, Dr. P S Goel, secretary, Ministry of Earth Sciences and chairman of National Institute of Occean Technology (NIOT) said, according to a report on www.hindu.com. When issuing a warning, the source of the earthquake and areas likely to be affected should also be studied.
(Source: www.hindu.com)

FMC Wins $122m Subsea Contract

FMC Technologies, Inc. won a $122m contract to supply the subsea gas production system for Petrobras' Mexilhão field offshore Brazil. The scope of supply includes six subsea trees, two subsea manifolds with multiplexed controls and related subsea systems. Field requirements include a subsea system rated for 10,000 psi and high temperatures to 300°F. Equipment for this project will be engineered and manufactured at FMC Technologies' facility in Rio de Janeiro. Deliveries are slated for 2008. The Mexilhão field is located in the Santos Basin, São Paulo State, about 160 km offshore and water depths of 320 to 550 m.

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NOAA and U.S. Navy Develop First Pre-incident Survey

The NOAA Office of Response and Restoration and the U.S. Navy have partnered to produce one of the first surveys of potential threats to coastal shorelines from a hazardous material spill or leak. The purpose of the survey is to document shoreline types and conditions in advance of a spill incident, enabling officials to develop spill response plans for areas at high risk for such incidents.

NOAA and the Navy surveyed the shorelines of Pearl Harbor, focusing on shoreline types, natural resources and historic structures most at risk for a hazardous spill. Pearl Harbor, Hawaii, is one of the most likely locations for oil spills in Oahu. In addition to a large naval fleet, bulk fuel storage, pipelines and a commercial power plant, the harbor is at particular risk of oil releases from sunken vessels including the battleship U.S.S. Arizona, which still holds several million gallons of fuel oil.

"This proactive survey is among the first to be conducted anywhere in the country and may serve as a prototype for other regions," said Ruth Yender, scientific support coordinator for the NOAA Northwest and Oceania regional response districts. "The survey establishes baseline conditions to aid in developing response strategies for shorelines at risk in the event of a release of oil or other hazardous materials."

The survey data will be processed into a user-friendly format for use by the Navy and other responders in Honolulu. The information also will assist the NOAA Office of Response and Restoration in efforts to help the Navy develop response plans and implement them in the event of a spill in Pearl Harbor.

"Developing new approaches to how one manages risk is an important part of NOAA's responsibilities as a federal trustee," said Capt. Ken Barton, acting director of the NOAA Office of Response and Restoration. "Being prepared to respond to threats to coastal resources is a critical part of the NOAA mission. Development of this prototype survey is a significant step in doing so."

Oil spill in Breton Sound, La., following hurricane Katrina in 2005.

(Photo Credit: NOAA)

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Hartmann Logistik Enters Offshore Vessel Market

Hartmann Logistik GmbH, a shipowner with a fleet including containerships, gas carriers, gas tankers, product tankers and bulk carriers, is expanding its offshore market presence with the ordering of a pair of Anchor Handling, Tug & Supply Vessels (AHTS), with an option for two more.

Italy's Fincantieri won the order, with delivery scheduled for December 2008 and February 2009.

Hartmann Logistik GmbH is the Hartmann Group company active in the Offshore Industry, which is headed by Dr. Niels Hartmann, son of the founder of the Group. Founded in 1981, Hartmann Reederei is a shipping and logistic company with a fleet of more than 100 vessels, and has a substantial newbuilding program currently going on with yards in Europe and the Far East.

The vessels, designed to the top class awarded by ABS, will be 250.9 ft. (76.5 m) long, 57.4 ft. (17.5 m) wide with a draft of 22.3 ft. (6.8 m) and a deadweight of over 3,000 tons. Equipped with four diesel engines capable of generating 16,000 hp, the ships will be capable of reaching a maximum speed of 16.3 knots and will have a bollard pull of at least 180 tons. The vessels will be able to work in any field of offshore operations and will carry out support activities for oil platforms, such as anchor handling and positioning, deep-sea towing, anti-pollution operations and fire-fighting (Fire Fighting 2 class equipment), transport of dry-bulk and liquid cargo.

Sonardyne Ranger USBL Acoustic Positioning System

Trials of Sonardyne's Ranger USBL (Ultra-Short BaseLine) system were conducted by Artec Subsea AS aboard its ConCat survey vessel. The Ranger system was installed alongside the permanent suite of advanced survey equipment carried aboard the 30 ft. boat which can be folded for transport inside a standard 40 ft. container. Developed to be easy to set-up and use, Ranger is the newest addition to Sonardyne's USBL product family. It provides a cost-effective solution for hydrographic survey and DP (Dynamic Positioning) reference tasks in up to 2,000 m water depth and incorporates Sonardyne's innovative Wideband signal technology enabling faster, more reliable and more accurate subsea navigation.

Following delivery and installation, the Ranger system was immediately set to work providing ROV positioning on a cable route survey off northern Norway. Artec Subsea's Managing Director, Tore Brekke says that he chose the system after being impressed by its specifications and performance during testing. "Now that we are using Ranger we are very happy as the positioning it is providing is proving very stable." He added "The system's portability means that we can use Ranger on a wide

range of ROV (Remotely Operated Vehicle) and towfish-based projects including high precision seabed mapping, offshore construction and site surveys.

Geometrics Delivers to Scripps

Geometrics Inc. has delivered an environmentally safe, 48-channel, 24-bit digital seismic streamer (GeoEel series) to the Scripps Institution of Oceanography (SIO). Installed by Geometrics personnel on the SIO research vessel, Roger Revelle, the narrow-diameter, easy-to-handle digital streamer will be used primarily for deep water research.

The Geometrics GeoEel is reportedly the first commercial high-resolution-digital streamer to be filled with a non-toxic, non-flammable silicone oil derivative, thus eliminating fire hazards or fines in environmentally-sensitive areas from accidental

Fuel-cell Subs for the German Navy

In late September the German Federal Office of Defence Technology and Procurement signed a contract for the delivery of two 212A class submarines. The contract was signed with the consortium "ARGE 2. Los 212A," the ARGE being made up of the companies Howaldtswerke-Deutsche Werft and Nordseewerke, which belong to the ThyssenKrupp Marine Systems shipyard alliance.

Both submarines will be equipped with an air-independent propulsion system based on the hydrogen fuel cell. The second batch for the German Navy will be constructed according to the already tried and tested general design for the first four submarines and will likewise be built in non-magnetic steel. In addition to expanded and improved surface and underwater sensor technology, the new submarines of class U212A have major innovations in the field of communication. This means that the submarines can be optimally deployed in Network Centric Warfare. They are also equipped for deployment of special forces. The delivery date for the two submarines is fixed for 2012 and 2013.

GeoEel on winch on deck of Revelle

rips or tears in a streamer's skin.

The wide bandwidth (up to 8KHz) of the GeoEel makes it applicable to all seismic surveys: petroleum, high-resolution engineering, and even sub-bottom profiling.

Only 1.5 in. (38 mm) in diameter and configurable with up to 240 channels and multiple streamers, the GeoEel sends data by Ethernet to any industry-standard low-cost PC. A comprehensive suite of software provides real-time gathers, brute stack, GPS integration, trigger timing, gun monitor and other data visualization, quality control and instrument tests.

The small diameter GeoEel's is very-quiet, making full use of true 24-bit circuitry.

In-water digitization eliminates ground loops and shipboard electrical noise, resulting in quick, clean quality installations. The compact GeoEel weighs about 1 kg per meter and is easily shippable by air as non-hazardous, non-flammable goods. Unique construction makes systems up to 48 channels deployable by hand on small vessels.

A thick 3.2 mm skin protects the GeoEel in shallow water and transition zone applications.

Tyco to Build Undersea System to Connect Rigs

Tyco Telecommunications signed a contract with BP America Inc. to supply an undersea fiber optic system serving offshore platforms in the Gulf of Mexico. The system will comprise the undersea backbone of a regional communications network, providing diverse connectivity from BP's Gulf of Mexico offshore production facilities back to the regional operating center in Houston, Texas.

The system will initially link seven deepwater production platforms with landings in Freeport, Texas and Pascagoula, Miss. The network incorporates an upgrade capability designed to support 64 platforms. The project has put emphasis on robustness and reliability as an outgrowth of the devastating 2005 hurricane season, which was particularly challenging for traditional communications systems. To achieve this, Tyco Telecommunications will deploy long haul undersea telecommunications technologies adapted for the unique requirements of offshore applications. Each platform will be served by a branch off of a deepwater trunk. Using optical multiplexing in undersea branching units, each platform will have direct optical connectivity to both landing stations, ensuring continued operations, independent of any other platform in the system during hurricane events. "Communications systems to high value production platforms, now further offshore in deep water, require the innovative application of undersea fiber optic technologies, especially in an environment that is susceptible to hurricanes," said Rob Munier, managing director for global solutions at Tyco Telecommunications.

Toll Signs JV to Service Offshore Oil and Gas Drilling

Toll Holdings has formed a new joint-venture operation in Western Australia to provide supply base services to offshore oil and gas drillers. Toll has signed an agreement with Mermaid Marine Australia (MMA) to serve a range of clients operating in the Browse Basin off Broome.

The company will be called Toll Mermaid Logistics-Broome. MMA Managing Director Jeffrey Weber says the joint-venture recognizes the strength of both companies. "[It] will provide our clients with world-class services to support their current and emerging requirements in the Browse Basin region," he says. Work has already started storing drilling casing for clients and lease agreements are being completed with the Broome Port Authority. Contracts covering integrated supply base services are also being finalised, MMA says, with new drilling campaigns expected within the next month. (Source: www.supplychainreview.com.au)

Aker Kvaerner Awarded Mooring Systems Contracts

Aker Kvaerner was awarded contracts worth $31.2m for the delivery of advanced mooring systems for semi-submersible oil rigs. The contracts comprise deliveries both to the offshore oil and maritime industry.

The awards include delivery of two advanced Aker Drilling H6e semi-submersible rigs to be built at Aker Kvaerner Stord and five deepwater semi-submersible rigs to be built at Jurong's shipyard in Singapore. The delivery dates are scheduled to occur between 2007 and 2009.

Sub-Sea Tech Will Be Accepted by O&G Sectors

Alpha Perisai Sdn Bhd believes that the introduction of AlphaPRIME sub-sea technology in the largely untapped marginal oil fields will be well received by oil and gas industry players. The company, a unit of Perisai Petroleum Teknologi Bhd, was formed through a joint venture with British-based Alpha Thames Subsea Ltd. in June last year. The latter developed AlphaPRIME, which is a system-modular installation located close to the wells on the seabed. It is configured for three-phase separation of oil, gas and water, which also incorporates multiphase pumps, with each installation consisting of at least two identical operating system modules.

(Source: http://biz.thestar.com.my)

Aker Kvaerner to Build Deepwater Drilling Risers

Aker Kvaerner has been awarded contracts to supply three subsea drilling riser systems, featuring Aker Kvaerner's innovative CLIP riser system, to Brazilian drilling company Queiroz Galvão Óleo e Gás S.A.

(Continued on page 15)

Side Scan, Metal Detector Help Locate Lost Pipeline

According the U.S. Department of Energy and the American Petroleum Institute, hurricanes Katrina and Rita were the worst in the history of Gulf of Mexico, causing unprecedented damage and prolonged evacuations. Many oil and gas facilities are still trying to get back to pre-hurricane operating levels including the Louisiana Offshore Oil Port or LOOP LLC. The port facility is located in 110 ft. of water 18 miles off the Louisiana coast and is jointly owned by Marathon Ashland Pipe Line, Murphy Oil Corp., and Shell Oil. It is the only port in the U.S. capable of off-loading deep draft tankers known as Ultra Large Crude Carriers (ULCC). The LOOP LLC consists of three single-point mooring buoys for the off-loading of crude tankers, and a marine terminal consisting of a two-level pumping platform and a three-level control platform. A 25 mile pipeline connects the port facility to an onshore storage facility. Four pipelines connect the onshore facility to refineries in Louisiana and along the Gulf Coast. Oil is also pumped through CAPLINE, a 40 in. diameter pipeline, to several refineries in the Midwest. In total, LOOP is connected to over 50 percent of the U.S. refinery capacity and has off-loaded over 7 billion barrels of foreign crude oil since its inception. After the hurricanes, the port facility and supply pipelines required surveying to verify the underwater structures were sound, and to confirm the location of pipelines which sometimes shift in heavy storm surge. David LeBlanc, an engineer with the company, reported that they had a difficult time hiring a survey firm to perform the needed side scan work. "After the hurricane the demand for side scan services was so great, we were told it would be weeks before they could do the job. When they finally showed up and performed the survey, we were only given a verbal report on the status of our structure and pipelines. Eventually we were given a rough map of the survey area, but it lacked the detail we were looking for. At that point we decided to purchase our own equipment and contacted JW Fishers to get more information on the type of equipment that would work best for our application."

Two pieces of equipment were selected to meet their requirements; a boat-towed metal detector and a side scan sonar. In addition to the survey work, one of their other projects was to locate and mark the position of a buried pipeline running from the platform. Most of the pipelines ran in roughly a straight line from the port, but one line made a strange loop. It was extremely important to mark the exact location of the pipe before new pilings could be driven. The engineers knew a magnetometer wouldn't be of much help because of the proximity to the large steel structure. They thought a metal detector might work, but the pipeline had several meters of mud covering it, which would put it out of range for a hand-held model. The JW Fishers Pulse 12 boat-towed metal detector was recommended by Fishers and proved to be the right tool for the job with it's significantly increased detection range.

LOOP's team decided the best way to use the Pulse 12 for this particular project was to have two divers drag the metal detector's search coil across the ocean bottom. They started tracking the pipeline from where it left the platform and entered the bottom. Knowing where the pipeline started, it was a relatively easy task to track it's path under the sea floor. As the coil was dragged across the bottom the topside crew monitored the metal detector's control unit and communicated to the divers when they were getting the strongest readings. "The Pulse 12 worked very well for this project," said maintenance support technician Andre Duet.

"We found all kinds of things buried down there."

For more information, e-mail info@jwfishers.com

(Continued from page 13)

The contracts have a value of approximately $80m.

The scope of work comprises three drilling riser systems, including tools and flotation, designed for use in 700 m, 2000 m and 2400 m water depth, respectively. Deliveries of the risers will be completed from Aker Kvaerner's new state-of-the-art facility in Rio das Ostras, Brazil, for within the next 17 to 30 months.

The drilling risers will be installed at three different rigs. Two of the rigs will operate off the Brazilian coast serving long term contracts between Queiroz Galvão and Brazil's national oil company, Petrobras. The third riser system will be used in Brazil and internationally.

Otto to Start of an Offshore Seismic Survey

Otto Energy Limited said it's wholly owned subsidiary, NorAsian Energy Limited (NorAsian), together with its Joint Venture partner Trans-Asia Oil and Energy Development Corporation (TransAsia), was to commence acquisition of 450-line km of seismic data in deep water Service Contract 55 on October 19, 2006. The survey is funded by the Vital Resources Corporation (Vital) and will be conducted by the seismic vessel Veritas Searcher.

Otto's Service Contract SC55 covers an area of 9,000 sq. km and is the first ultra deepwater block awarded by the Philippine Department of Energy.

The current seismic acquisition is focused on the Marantao prospect, a carbonate build-up (reef) interpreted to be at least five times larger than the Malampaya reef structure, Philippines largest oil and gas field operated by Shell. Marantao lies in 1,900 meters of water and is more than 150 sq. km in size at closure level with at least 500 meters of vertical relief.

WHOI Forum: Lessons from the 2004 Indian Ocean Tsunami

How coastal communities manage risks associated with major tsunamis is an issue of global importance following the devastating 2004 Indian Ocean tsunami that killed an estimated 200,000 people and caused billions of dollars in damage in 11 nations. The issue also has important implications for the general public on Cape Cod and in coastal communities throughout the United States in managing other types of natural disasters, such as hurricanes.

"Lessons from the 2004 Indian Ocean Tsunami" brought together a distinguished group of speakers on the science of underwater earthquakes and tsunamis, natural hazard management and response, and regional planning. This first annual Elisabeth and Henry Morss Jr. Colloquium at the Woods Hole Oceanographic Institution (WHOI) was on October 31 at the Lillie Auditorium in Woods Hole, Massachusetts.

The colloquium also promoted collaboration between natural and social scientists toward the development of a sustainable hazard mitigation program for coastal communities, and encourage closer communication between WHOI and the United Nations, NOAA, and other agencies. Speakers included Dr. Stephen J. Atwood, UNICEF regional advisor and recent director of tsunami operations in Indonesia, Dr. Philip R. Berke, an environmental planner and professor and director of graduate studies in city and regional planning at the University of North Carolina at Chapel Hill, and Dr. Emile A. Okal, a professor of geology and expert on tsunami and earthquake research at Northwestern University.

Dr. Atwood has been actively involved in emergency response activities since the 2004 Indian Ocean tsunami and was recently on special assignment as Director of Emergency Operations for the tsunami recovery effort in Indonesia. He advises the UNICEF Country Offices in the East Asia and Pacific Region in the formulation and application of health, nutrition, water and sanitation policies.

Dr. Berke's current research projects address domestic and international issues in the areas of land use planning, natural hazard mitigation, and sustainable development. He has served as a consultant on land use and environmental planning to state and local governments, as a hazard mitigation specialist for the Federal Emergency Management Agency, and as a consultant on disaster recovery to international disaster relief organizations.

Dr. Okal has extensive field experience in post-tsunami investigation and survey, including, most recently, as leader of two teams that assessed the effects of the 2004 Indian Ocean tsunami in Madagascar and Oman.

Scientists to Fake Oil Spills

A group of Arctic oil spill experts who recently met in Halifax say they plan to create artificial spills in northern waters to learn how to clean them up.

Six oil companies are backing a series of international experiments aimed at improving technology for cleaning up spills in the frigid waters of the Arctic.

According to these experts, more oil production and shipping traffic in the Arctic has increased the risk of spills but the clean-up technology is not well-developed.

During the next three years, the scientists plan to create oil spills in Canada's Beaufort Sea and also in Arctic waters off of Norway.

Red Tide Models,Forecasts Expanded in Gulf of Maine

A new observation and modeling program focused on the southern Gulf of Maine and adjacent New England shelf waters could aid policy makers in deciding whether or not to re-open, develop, and manage offshore shellfish beds with potential sustained harvesting value of more than $50 million per year. These areas are presently closed to the harvest of certain species of shellfish due to the presence of red tide toxins. Researchers at the Woods Hole Oceanographic Institution (WHOI) and colleagues from seven other universities or agencies began the five-year Gulf of Maine Toxicity program, or GOMTOX, on September 1. The $7.5 million dollar program is funded by a grant from the National Oceanic and Atmospheric Administration's (NOAA) National Ocean Service, Center for Sponsored Coastal Ocean Research (NOS/CSCOR) through the ECOHAB program. The new research effort expands past studies in the Gulf of Maine and builds on data collected during the historic 2005 red tide, which led to closure of both nearshore shellfish beds and offshore beds in federal waters out to Georges Bank. The toxicity also extended for the first time to the islands of Martha's Vineyard and Nantucket. The Gulf of Maine (GoM) and its adjacent southern New England shelf is a vast region with extensive shellfish resources, large portions of which are frequently contaminated with paralytic shellfish poisoning (PSP) toxins produced by the dinoflagellate Alexandrium fundyense. GOMTOX will utilize a combination of large-and small-scale survey cruises, autonomous gliders, moored instruments and traps, drifters, satellite imagery and numerical models.

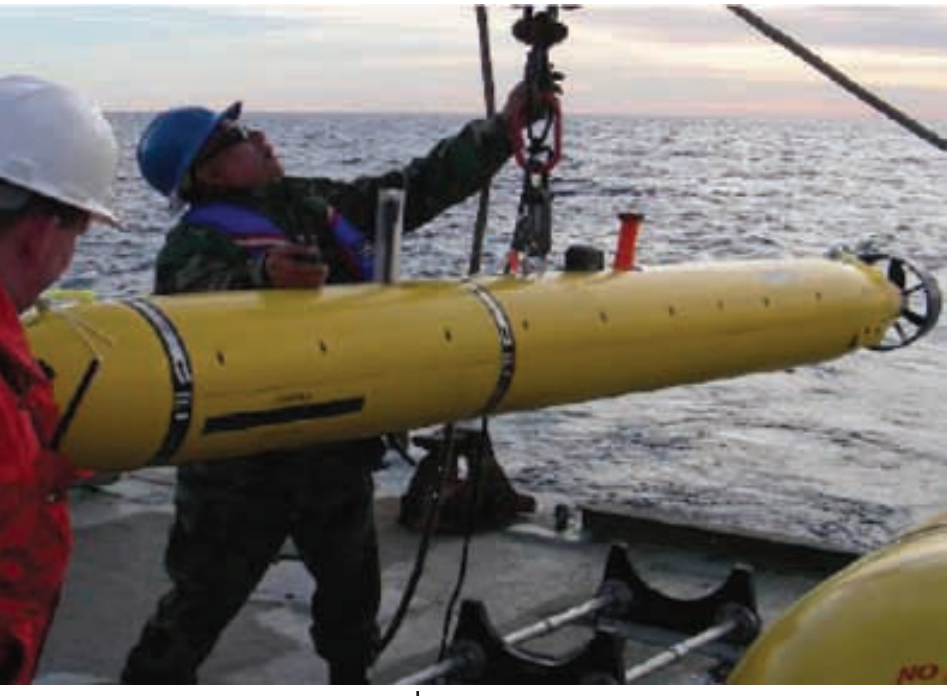
Researchers will incorporate field observations into a suite of numerical models of the region for hindcasting and forecasting applications for both near shore and offshore shellfish resources. In addition to WHOI researchers, scientists participating in GOMTOX represent Canada's Department of Fisheries and Oceans, NOAA's Northeast Fisheries Science Center, the Canadian National Research Council, the U.S. Food and Drug Administration, University of Maine, University of Massachusetts, and the Stellwagen Bank National Marine Sanctuary.

Navy news

Bluefin and QinetiQ Win $18m U.S. Navy Contract

Bluefin Robotics Corporation and QinetiQ announced the award of a $18 million contract from the U.S. Navy, Naval Sea Systems Command (NAVSEA) to support design, development, fabrication, and testing of surface mine countermeasures (SMCM) addressed by unmanned underwater vehicles (UUV). Work will be performed in Cambridge, Mass. and Winfrith, U.K., and is expected to be completed by February 2009.

The proposed UUV System, which is the second increment of the SMCM/UUV program, will be comprised of two Bluefin-12 vehicles equipped with QinetiQ's synthetic aperture sonar (SAS) system.



In fact, QinetiQ's share of the aforementioned award is a three-year contract worth $7.7m from Bluefin Robotics Corporation to deliver synthetic aperture sonar (SAS) for use with Bluefin-12 unmanned underwater vehicles (UUVs).

The SAS will ensure the Bluefin UUVs record high resolution seabed data images at high area coverage rates. This is the first multiple order for QinetiQ's SAS technology and a major breakthrough for the company in this highly competitive area of the US defense market.

QinetiQ's Group Managing Director for Defense and Technology, Andrew Sleigh, said: "The SAS system builds on our long-standing research in sonar technology and we are pleased to work with Bluefin to deliver advanced capabilities to the U.S. Navy. It complements our previous delivery of unmanned vehicles for mine countermeasures operations to the Royal Navy, a system that helped clear mines from a key strategic waterway in Iraq."

"We are very excited about the award of this contract" said Dr. Brian Abraham, CEO of Bluefin.

"This contract allows us to expand our support of NAVSEA, leveraging our experience and leading edge technologies with the Littoral Combat Ship Program and to expand our corporate collaboration with QinetiQ."

The Bluefin-12 vehicles will play a major role in enabling the Navy to prosecute surface mine countermeasures missions that support homeland security.

Bluefin was previously awarded a $10,900,000 contract from NAVSEA in September of 2005 to provide the Littoral Combat Ship (LCS) program with Bluefin-21 robotic platforms.

QinetiQ and Bluefin worked together on a joint Ministry of Defense and Office of Naval Research project between 2003 and 2005 in which the team successfully designed, developed and demonstrated the 'Gambit' UUV with an advanced mine countermeasures SAS payload.

Navy Sensors Rack Up Repairs

A navy ship that helps Canada scan for enemy mines on the sea floor of the west coast has twice damaged its high-tech underwater gear, racking up big repair bills. The incidents involving HMCS Whitehorse have prompted reprimands and tighter controls over how the sophisticated technology is used.

For more than a year, Whitehorse's crew has been mapping the sea floor around Vancouver Island using side-scan sonar.

But on Oct. 14, 2005, the five-meter-long sensor — known as a towfish — smashed into an unexpected pinnacle of rock rising sharply from the sea floor. The navy could not provide the exact cost of repairs to date, but said it was between $50,000 and $100,000.

And on June 15, a second towfish smashed into a ridge of rock near the entrance to the Nanoose experimental test range, on the east coast of Vancouver Island.

The impact damaged a tail fin, a shaft and internal electronics, including a gyroscope. MacDonald, Dettwiler and Associates Ltd. is repairing the device for the navy, but the bill is expected to be between $100,000 and $200,000.

With only four towfish available for work on the West Coast, half the naval inventory has been damaged. Records released under the Access to Information Act show that investigators blamed carelessness on the part of the operators for the second incident, but absolved them for the first. (Source: www.theglobeandmail.com)

Q&A

OceanTech Expo (OTEC) 2007

Set for October 2-4, 2007 in Providence

MTR What is the OceanTech Expo?

RH OceanTech Expo is the first of what will be an annual trade show for the ocean technology and marine science industry.

MTR How will this exposition differentiate itself from other conferences and expositions?

RH OceanTech — OTEC for short — is an Industry Trade Show, not a meeting or technical conference with an expo component. The Expo is the center of the event and all things coinciding with the expo are to enhance the expo and keep attendees involved with the event.

MTR From an exhibitor standpoint, what is the attraction of participating?

RH First, OTEC is an internationally marketed event that provides companies in this industry an interactive environment conducive to developing client relationships and sales. Second, the OTEC schedule keeps attendees focused on the products and services being exhibited, keeping the spotlight where it should be: on the technology.

MTR Aside from traditional exhibit hall booths, what other way can a company selling to this market participate and benefit from OceanTech Expo?

RH They can provide attendees face to face training on their products in a breakout session, they can offer attendees hands on knowledge of the products thru the on water demos or they can sit in on an industry outlook session and gain insight on potential business or technology that might need to be developed. All aspects of the show are geared at increasing the bottom line of exhibitors.

Rob Howard

MTR Why was Providence, RI chosen for OceanTech Expo?

RH Providence was chosen for its central location between the west coast and Europe, northeastern Canada and the eastern seaboard. There is a strong base of government agencies, universities, R&D and tech companies in this region, and it has close proximity to water for a short 15 minute commute to the on-water demos. The convention center is easily accessible and centrally located in a clean, historic city center with dining and entertainment that is in walking distance for guests.

MTR How has the industry responded?

RH Industry response has been tremendous. As soon as people hear about

OTEC 2007 Fast Facts

When: October 2-4, 2007
Where: Providence, Rhode Island
Web: www.oceantechexpo.com
Contact: Rob Howard
Email: howard@marinelink.com
Tel: +1 561-732-4368

the format and purpose of OTEC they want to be involved. A great example of this is in our Executive Advisory Committee. When we set out to produce this event, we wanted to make sure that companies and organizations had a voice in the planning and format of the show so I asked Steve Withrow from Trinity Consulting to head this up and manage it for us. Steve was thrilled and has done a great job, putting together a well rounded group that realize the benefits of and the need for an event like OTEC. The OTEC EAC has members representing all segments of the market from undersea defense to offshore oil and gas to science. A full list of OTEC EAC members and their bio's can be seen at www.oceantechexpo.com. We are also sponsored by the Marine and Oceanographic Technology Network or MOTN. MOTN is a valuable sponsor made up of companies from this industry focused on promoting their technology and services and advancing the industry.

MTR Can you give us insights as to the expected attendee profile?

RH As this is the first event I can say we are doing the obvious, marketing to the people responsible for purchasing and specifying equipment and services for use in the field via MTR, direct mail and online. But ultimately, no one knows better who they want to attend better than the exhibitor, so we will be supporting our exhibitors with a VIP attendance initiative that will help exhibitors attract key clients and prospects to the event. This level of interaction between the event and the exhibitor is what really makes the OceanTech Expo unique.

vessels

The Class of 2006

With a plethora of boats and ships plying the world's waters in the name of undersea technology for the purpose of science, commerce or defense, MTR examines some of the more notable vessels delivered and announced in the past 12 months.

VT Halter Builds for NOAA

VT Halter Marine Inc. and the National Oceanic and Atmospheric Administration have collectively had much to celebrate recently, as NOAA and the Mississippi-based shipbuilder have forged a strong relationship, culminating with a number of recent deliveries and contracts. Most recently, the pair celebrated construction milestones for two new vessels at the Moss Point, Miss., shipyard. A traditional keel laying ceremony was conducted for NOAA ship Pisces, which was preceded by the initial cutting of steel for the fourth and final vessel in the series. The sister ships will join NOAA ships Oscar Dyson and Henry B. Bigelow, which were also built by VT Halter Marine.

The 208-ft. ships are being built to meet the requirements of NOAA Fisheries Service as well as tough acoustic quieting standards set by the International Council for Exploration of the Seas, a European-based organization that has developed a set of standards to optimize fisheries research. NOAA fishery ships have highly specialized capabilities, such as performing hydro-acoustic surveys of fish, bottom and mid-water trawls, and running physical and biological-oceanographic sampling during a single deployment.

Once operational, the new fisheries survey vessels will be operated, managed, and maintained by NOAA's Office of Marine and Aviation Operations, composed of civilians and commissioned officers of the NOAA Corps.

NOAA's new Pisces takes form at Moss Point. (Photo: Don Sutherland)

A SWATH for NOAA

NOAA reported that VT Halter Marine, will complete the final design and build of a new Small Waterplane Area Twin Hull Coastal Mapping Vessel (SWATH CMV) for the agency. NOAA exercised a $15 million option for the ship with VT Halter Marine, which also completed the vessel's preliminary design under a separate option. The primary mission of the SWATH CMV will be to map the full seafloor in coastal areas for the nation's nautical charts. It will operate in waterways along the Atlantic and Gulf coasts, Caribbean Sea and Great Lakes, conducting basic hydrographic surveys of the seafloor using side scan and multibeam sonar technologies. The vessel's ability to monitor and detect changes to the seafloor-including obstructions, shoaling, and other dangers to navigation-will enhance the nation's commerce and security and improve our ability to characterize marine ecosystems.

VT Halter Marine expects to deliver the SWATH CMV by the summer of 2008. The nearly 38-m long vessel will be homeported at Fort Point in New Castle, N.H., and will replace the 40-year-old NOAA ship Rude. Locating the vessel at New Castle will significantly enhance coastal and ocean mapping research partnership opportunities with the NOAA Joint Hydrographic Center at the University of New Hampshire.

"The SWATH design is particularly suited to NOAA's mission to map the ocean floor, as it is less responsive to wave action than a monohull ship," said Rear Admiral Samuel P. De Bow Jr., director of NOAA's Office of Marine and Aviation Operations and NOAA Commissioned Officer Corps. "Its reduced motion will result in more reliable acquisition of survey data, and its enhanced seakeeping ability will make it a more efficient survey plat-

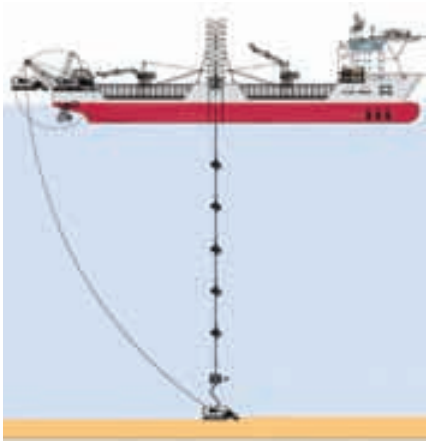
VT Halter Marine will build a new SWATH for NOAA.

form." U.S. Senator Judd Gregg, who was instrumental in securing funds for the SWATH CMV, said, "This vessel provides a cutting-edge platform for NOAA and UNH scientists and undergraduates to test new ocean mapping technologies and conduct hydrographic research in near coastal environments, previously inaccessible with traditional vessels. The SWATH ship will help to grow the already successful UNH-NOAA partnership and help UNH remain a national leader in oceanographic work." "We are excited to build this first-in-class SWATH CMV for NOAA," said Boyd E. King, VT Halter Marine's chief executive officer. "It is always exciting to take a project from blueprint to blue water. The SWATH CMV will be the fifth NOAA vessel that VT Halter Marine will build in support of NOAA's active fleet replacement program."

D/V Chikyu.
(Photo Credit: JAMSTEC)

Once operational, the new SWATH CMV will be operated, managed, and maintained by NOAA's Office of Marine and Aviation Operations, composed of civilians and commissioned officers of the NOAA Corps, one of the nation's seven uniformed services. The SWATH will support the nautical charting mission of NOAA's Office of Coast Survey.

"Jules Verne" will help Nautilus mine the ocean's floor by 2009.



Chikyu

Chikyu — the Japanese word for "Earth" — is a state-of-the-art scientific drilling vessel that is designed to drill to 7,000 m below the seabed at approximatedly 2,500 m water depth. Built at Mitsubishi Heavy Industries for more than $500 million, Chikyu's first scheduled assignment will be in the Nankai Trough, a Pacific Ocean zone between two tectonic plates that have produced powerful earthquakes through Japan's history. When it begins service as scheduled in 2007, it could be the first vessel to drill to the earth's mantle, and is intended to play a major role in the Japanese effort to protect the country from the devastation associated with earthquakes.

While one of the missions of Chikyu — to tap and study the earth's mantle — is revolutionary, it relies on equipment proven in other offshore industries to help it achieve this end. It is equipped with the riser drilling system that has achieved success in oceanic oil drilling, and is designed to shield the vessel against eruptions of methane gas and pressurized fluids, while allowing for the retrieval of valuable core samples. In addition, the vessel's Dynamic Positioning System (DPS) is designed to keep the vessel on position, counteracting the drift from wind, waves and sea current. The 210 m, 57,000 ton ship can efficiently remain on station using its GPS and six azimuth thrusters.

There are four integrated research areas on the vessel that house multiple research facilities for physical, scientific, and biological analysis by using the sampled core (cylindrical sediment and/or rock sample) and the drilled hole.

Nautilus Mining Vessel

Nautilus Minerals entered in to a Heads of Agreement with Belgium based Jan De Nul, one of the world's leading international dredging companies. Under the agreement, Jan De Nul will construct, at its cost, a specialized deep sea mining vessel for Nautilus's Solwara Project in Papua New Guinea (PNG). The 191-m vessel — to be named Jules Verne — is expected to be completed in 2009 to meet Nautilus's targeted, subject to PNG government approval, end 2009 date to commence mining operations. "This agreement with one of the world's leading dredging companies is a major milestone in the project," said David Heydon, Nautilus CEO. "Jan De Nul will join Nautilus in its plans to be the first to mine the deep oceans of the world for copper, gold and zinc. Such a move represents the dawn of a new era in mining: The creation of a whole new indus-

try. We have seen how the offshore oil and gas industry has evolved since its early days - to the point where society is now reliant on offshore oil/gas to meet its needs. Likewise, seafloor resources may one day be critical for society to meet its future needs for copper and zinc."

"Jan De Nul is committing significant capital to build this specialized mining ship. This agreement lays off the capital for the mining ship - our largest and longest lead time item - and puts us on track of our goal of production by end 2009. We chose Jan De Nul to partner with us on this exciting project as they have the world's most modern fleet, the largest dredgers in the world and are recognized as the innovators in the dredging industry."

Jules Verne will be a dynamically positioned ship capable of deploying mining equipment, pumps and riser pipes for the operations at Solwara 1, which lies on the seafloor in up to 1,700 m of water. The plan calls for the copper - gold material to be dredged from the seafloor and pumped to the mining vessel where it would be transferred to barges for transport to a land based concentrator which would produce a gold-rich copper concentrate for dispatch to copper smelters.

Jan De Nul will build, own and operate the mining ship, and will provide barges, tugs and operational capability in its role as mining contractor for the Solwara 1 Project. Nautilus would provide the capital (budget estimate $120 million) for two sub sea miners, power umbilicals, pumps, 1,800 m riser pipe and related handling equipment. Jan De Nul will reimburse Nautilus over time for this capital by rebating 6.5% of each monthly contract mining invoice, effectively purchasing the equipment from Nautilus.

A New Standard of Quiet

Institutions throughout North America are paying a lot of attention to the University of Delaware's new research vessel the Hugh R. Sharpe delivered from Dakota Creek Industries. 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, going 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. 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.

RV Fulmar

Hugh R. Sharpe

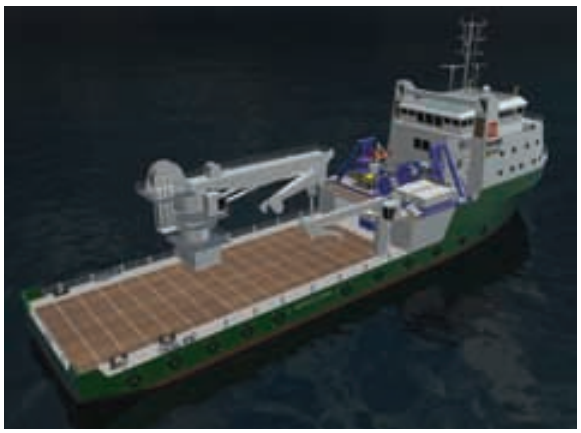
R/V Auk & R/V Fulmar

All American Marine launched a 48 x 21-ft. cata-

maran built under contract for the National Oceanic and Atmospheric Administration (NOAA). The R/V Auk will operate in the Stellwagen Bank National Marine Sanctuary, located at the mouth of Massachusetts Bay. R/V Auk is the second research vessel built by All American Marine for NOAA's National Marine Sanctuary program. The 48-ft. catamaran is a shorter version of the previously built R/V Shearwater, which operates in the Channel Islands National Marine Sanctuary near Santa Barbara, Calif.. Fabricated with all-aluminum construction, the vessel includes a unique hull shape with integrated hydrofoil technology developed by Teknicraft Design of Auckland, New Zealand. Features of the research vessel include both a wet laboratory for examining specimens and a dry laboratory for processing data. On board the vessel's main deck are a fully equipped galley and comfortable dinette with u-shaped settee. The catamaran offers accommodations for six researchers and includes heating and air conditioning for the entire vessel. Heated windows have also been installed to provide fog-free visibility in cold climate conditions. All American Marine also delivered a 66.8 x 24 ft. catamaran for NOAA. R/V Fulmar (pictrred on the previous page) will operate in the Monterey Bay National Marine Sanctuary, Cordell Bank National Marine Sanctuary, and Gulf of the Farallones National Marine Sanctuary, which are all located off the coast of central California. R/V Fulmar is the third research vessel and fourth Teknicraft Design catamaran that All American Marine, Inc. has built for NOAA's National Marine Sanctuary program. The 24-ft. beam of the catamaran lends itself to a very spacious cabin that can comfortably accommodate 10 scientists. The vessel's layout features an 86 sq. ft. wet laboratory and a 71 sq. ft. dry laboratory to accommodate the research activities throughout the sanctuaries. On board the vessel's main deck are a fully equipped galley and comfortable dinette with u-shaped settee.

Westplast Seismic Survey Boat.

Bourbon Trieste.



Westplast Seismic Survey Boat

Westplast AS based in Leinøy, Norway, recently delivered to PGS Geophysical a new 9.5 m Seismic Survey boat for world-wide surveying duties. Designed by Westplast AS and Sundal Engineering AS the GRP hull provides a smooth and stable ride. The transom has been designed with a recess to incorporate the water jets and engine exhaust system.

Fitted with twin UltraJet 305HT waterjets coupled to Yanmar 340 hp 6LYA-STP engines the boat achieved 30 knots during North Sea trials and a bollard pull of 2.6 ton at 3,000 rpm. This is the first of two boats that are being considered by PGS Geophysical for their new fleet of survey craft. Westplast AS have been building GRP boats for over 20 years and currently employ seven people in their Leinøy boatyard. The company has also become involved with building large GRP local art projects in Leinøy. WP950 will be used for survey exploration and recovery work and can carry a crew of four and surveying equipment. On board electronics include a Seiwa Mk III, black box ecosounder 50/200 khz, black box radar and 20-in. screen, Navman 7200 VHF, UHF, Autopilot ComNav 1440 and Compasspoint G2 GPS system.

The craft has a towing force of 2,600 kg, a cable lifter of 20 kg, a 1,500 kg main winch and a secondary winch on the bow. The Twin UltraJet 305HT jets produce thrust for a top speed of 30 knots so has the ability to get to survey sites quickly. The UltraJet control system, which is connected to the electronically driven helmsman's seat, gives fingertip control and precise maneuverability at all speeds.

Maria S. Merian

One of the world's most modern research vessels — named Maria S. Merian after the scientist born in 1647 — was delivered for scientific exploration on February 9, 2006. Maria S. Merian is to support the Polarstern as a floating laboratory during work in Arctic circles. Polarstern was also equipped with Hatlapa products. Seven special winches were supplied to the shipyard in December 2003 already, which are also used for moving the underwater equipment. Hatlapa has escorted this project for five years, during which time the design of the winches was formed in close cooperation with the order principal BAW (Bundesanstalt für Wasserbau) and the shipyard Krögerwerft in Rendsburg.

ROV Intervention Vessel

Sonsub entered into a long term charter with Bourbon, for the provision of a new vessel to be dedicated to deepwater intervention in West Africa. The vessel — to be delivered at the end of 2007 — will be named Bourbon Trieste, in honor of the famous bathyscaphe that holds the world record for the deepest dive. The vessel will be 85 m long by 18 m wide with a DP Class 2 diesel-electric propulsion system. There will be a 100-ton AHC knuckle-boom crane and a 10-ton auxiliary crane.

Based on specific job requirements, Sonsub will install one or two Innovator Heavy Work Class ROV systems with full 3,000 m water depth operating capacity.

The spread will be dedicated mainly to Light Subsea Construction and IRM activities in deepwater

Cable Repair Boat

Paras Marine launched its new Cable Repair Boat, which is the brainchild of Naval Architect Alastair Hunter. The 7.6-m craft is designed as a fail safe platform for streamer in-water maintenance, to significantly reduce the number of accidents associated with the use of work boats in the Marine Seismic Industry. It is also designed to be used as a fast rescue craft. The unique hull is designed to allow for cables to be accessed from below in a central well, immediately dispensing with the need for overloading one side of the craft, or leaning outboard in order to make repairs. Despite being an inherently stable platform, the CRB is designed to survive inversion with automatic engine shut-offs and is fully able to re-start once righted.

Survey Vessel

SeaArk Marine delivered a 42-ft. Dauntless Class Survey Vessel to the U.S. Army Corps of Engineers, Navigation Survey Branch of the Charleston District.

The vessel, The Evans, is tasked with conducting hydrographic surveys in Charleston, Georgetown and Port Royal harbors, as well as other navigable waters throughout the Charleston, SC District.

The craft will also be involved in Environmental Management Program projects and regulatory inspections of harbors and waterways. The SeaArk 42-foot Dauntless is constructed of all-welded marine grade aluminum. The state of the art design incorporates a two-man climate controlled pilothouse and aft survey cabin. Vessel enhancements include a fully integrated Furuno NavNet system and a comprehensive array of survey equipment. Crew accommodations include hydraulic/suspension seating, marine head, potable water, stove, microwave and refrigerator. The main propulsion engines are twin Cummins QSC 8.3M diesels, each rated @ 490 HP with Twin Disc gears. For onboard electrical service, an 8.0 Kw Northern Lights generator and 50 amp shore power are provided.

Fully operational, the boat achieves a maximum speed of 30 knots.

The Evans will be replacing the current survey vessel Blair.

Paras Marine's Cable Repair Boat.

Survey Vessel from SeaArk.

Subsea Processing: A $3.4B Market

Expenditure on subsea processing systems is expected to amount to some $3.4 billion over the 2006-2015 period, which in the most favorable conditions could increase to as much as $5 billion. Operator opinion has evolved over the past three years and now many have firm plans to install, with the prospect of improved recovery and production driving uptake.

These are amongst the results of the latest 'Gamechanger' study from energy analysts Douglas-Westwood Limited and oil & gas technology specialists OTM Consulting.

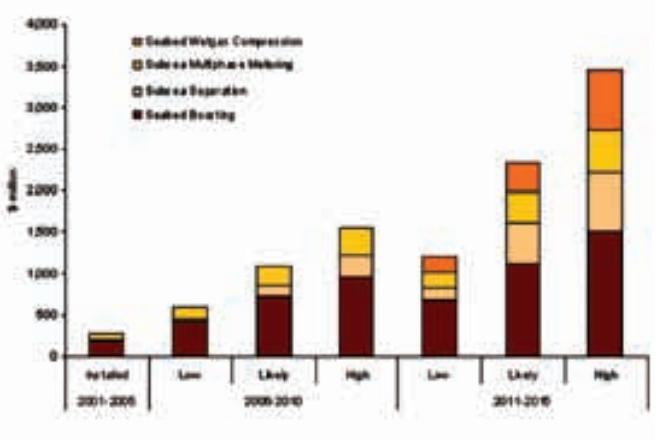
Addressing delegates at the Subsea Technology conference in London, Douglas-Westwood's Oil and Gas Manager Steve Robertson announced the headline results of the study, which considers seabed boosting, separation, multiphase metering and wetgas compression systems. Robertson said, "If operators' performance expectations are met, then over the next decade expenditure on subsea processing could in our 'most likely' scenario amount to over $3.4 billion. A total of 131 seabed boosting applications are expected to account for 54 percent of this 10-year total, in addition to 28 forecast separation systems, we expect 1,005 multiphase meters and 15 wetgas compressors. Western Europe is expected to be the leading regional market with a mid-range projected Capex of $1.1 billion over the 2001-2015 period, followed by Africa ($788 million), Latin America ($594 million) and North America ($576 million)."

George Trowbridge, Senior Consultant at OTM said, "With oil prices having risen dramatically the drivers for subsea processing have changed. Whilst in the past, the drivers that have encouraged interest in this area have been evenly spread between certain technical, production and financial factors, production related drivers (increased production rate, increased ultimate recovery, etc.) are now seen as being much more important.

"Changes have also been identified in oil companies' perceptions of the barriers preventing the uptake of subsea processing. Whilst both psychological hurdles (e.g. the naturally risk averse nature of oil companies) and financial hurdles (e.g. capital costs) are still high on the list of barriers to the uptake of subsea processing, there has been a shift in operator opinions so that now equipment reliability and operability is now seen as the highest ranked barrier.

"The changes in the drivers of and barriers to subsea processing are reflected in the forecast uptake of the technology. In our 2000 and 2003 surveys, a number of fields were identified as possible sites for subsea processing, whilst in the latest 2006 survey, several oil companies now have firm plans to use subsea processing, with potential areas of application spanning all the major deepwater regions of the world."

Figure 1
Global Subsea Processing Market by Component • 2001-2015



Source: The Subsea Processing Gamechanger Report 2006-2015

The Report

The Subsea Processing Gamechanger Report is the first in a new series of reports that will examine the commercial prospects for technologies that show early potential to make a major impact on industries.

The Subsea Processing Gamechanger Report has 140 pages, 102 figures and 30 tables.

For information, contact Steve Robertson at admin@dw-1.com

GIS Day '06

8th Annual Geo-Spatial Science Conference and College Fair University of New Hampshire, Durham, NH

By Maggie L. Merrill

Every year University of New Hampshire hosts a GIS day to bring students and teachers, and representatives of industry and government together to share information about the field of geographic information systems. The 8th annual GIS day was focused on ocean mapping and exploration vehicle models. Past years' GIS days have featured collaborations with National Aeronautical Space Agency (NASA), United States Geological Survey (USGS), and urban planners. According to the event coordinator, Micheal Routhier, "without the "marine" orientation provided by event co-organizers at Woods Hole Oceanographic Institution (WHOI), National Oceanic and Atmospheric Administration (NOAA) and at the UNH Center for Coastal Ocean Mapping/Joint Hydrographic Center (CCOM/JHC) the event this year would not have occurred."

Key note speaker, NOAA, Captain Maureen Kenny presented a brief history of bathymetric methods to map the sea floor to an audience of over 300. Kenny explained that the need to understand water depth was first driven by our desire to bring goods from one place to the next over water. We had to know what the harbor bottom depth was so we could determine where to land cargo. Soundings in those days, which were documented to be around 1415 BC, were done with sounding poles and lead lines, technologies that have not been completely abandoned to this day.

Chart making as a function of government was started officially in the 1500s (AD) and was greatly enhanced and accelerated by all the oceanic exploring that was being done by the early Europeans in search of new territory and riches. In 1807, Thomas Jefferson created the Coast Survey agency, which was the predecessor to NOAA. NOAA will be celebrating its 200th anniversary the entire year of 2007.

Fast forward to the early 1900s and the introduction to the use of acoustics to determine water depth. At the beginning of World War I, with the prospect of attack submarines threatening U.S. shores, the U.S. Navy collaborated with NOAA to map the coastal regions for strategic purposes. As the study of underwater acoustics advanced, so did the ability to gather even more precise and fine resolution data of the sea floor. Single beam and multi beam echo sounders were used and then side scan sonar was utilized to "mow the lawn." That is hydrographer-speak for towing sonar devices behind a ship or on an ROV dangling well below a ship to take wide swath sonar shots of the sea floor beneath. That process requires the ship to run survey lines miles long. The data must then be "cleaned and crunched" to display all of the features seen in the many images adorning the walls of UNH's Morse Center. The processed data also shows any targets of interest that would require a closer look using more precise equipment.

Recent advancements in remote sensing technologies have introduced new and efficient methods to acquire information about the earth and about the sea floor. According to www.NOAA.gov, LIDAR, Light Detection and Ranging is an active remote sensing system that can be operated in either a profiling or scanning mode using pulses of light to illuminate the terrain on shore and it can penetrate clear water (up to 50 m) to provide sea floor heights as well. LIDAR data collection involves mounting an airborne laser scanning system onboard an aircraft

Captain Maureen Kenny and John Kelly of NOAA's Coast Survey Development Laboratory.

(Photo credit: Maggie L. Merrill, MTR)

along with a Global Positioning System (GPS) receiver to locate an x, y, z position and an inertial navigation system to monitor the pitch, roll, and heading of the aircraft. By accurately measuring the round trip travel time of the laser pulse from the aircraft to the ground, a highly accurate spot elevation can be calculated. LIDAR has been tested in a wide variety of oceanic applications including assessing post storm damage to beaches and mapping the Greenland ice sheet.

Another useful and powerful tool for ocean mapping was developed by Dr. Walter Smith of NOAA and Dr. David Sandwell of Scripps Institution of Oceanography about 10 years ago. They developed a method to represent global seafloor topography from measured and estimated gravity data derived from satellite altimetry and shipboard depth soundings. Gravity anomolies are areas of the ocean surface that actually depress or expand in response to the gravitational forces of what lay beneath. This method of ocean mapping has greatly augmented the sparse coverage of seafloor mapping, especially in the southern ocean. Using satellite altimetry for seafloor mapping does not offer the level of detail of what a side scan sonar can produce, but it can produce extremely useful maps of lesser known trenches, ridges and volcanoes that can then be investigated more precisely using different tools.

Captain Kenny joined NOAA as Corps Officer in 1975. She has pursued a career in the nautical charting field including survey data acquisition aboard several NOAA survey ships. She graduated from the University of Michigan with a major in Mathematics and obtained a Masters of Science in Oceanography and Hydrography in 1983 from the Naval Postgraduate School. Most recently Kenny was Commanding Officer of the NOAA ship, Whiting. Captain Kenny retired from the NOAA Corps in 2003. She is now serving as deputy chief of NOAA Coast Survey Development Laboratory of the National Ocean Service, which is

(L-R) Lindsay Gee-IVS 3D, Briana Sullivan-UNH Center for Coastal and Ocean Mapping, Erin Heffron - IVS 3D and Roland Arsenault-CCOM often collaborate to develop new ways to improve the look and delivery of data sets resulting from many NOAA survey and research missions.

(L-R) Essex Agricultural and Technical High School students Nick Galloway, teacher, Anne Witzig, Mike Dannehy, Kelly Noonan, Robert Perocchi, Colleen Cannon, Heather Birchmore visited the GIS Day at UNH as part of their course on using GIS to map wetlands.

(Photo Credit: Maggie L. Merrill, MTR)

responsible for developing and applying new technologies to provide more accurate and timely charting and oceanographic information.

We know a lot more about MARS at this point than we do about the ocean floor. In fact we have mapped approximately 20 percent of the ocean floor. There is so much more to do and there are many opportunities of adventure and exploration."

All the satellites, fly-overs, sonar "lawn mowing" and data in the world will not solve the problem, what is needed and what has become available are products that enable the seafloor data to be displayed for a variety of users. One company that specializes in data assimilation for oceanographic users, is Interactive Visualization Systems (IVS-3D). Its Fledermaus software enables users to interact with massive geographical data sets of all types. Additionally, L-3 Communications Klein Associates, Inc. manufactures side scan sonar systems that have been used to locate the Titanic, the wreckage of the space shuttle, Challenger and many other items that appear on the seafloor. The systems provide high speed, full bottom coverage at very high resolution to world navies, government agencies, offshore energy companies and researchers all over the globe.

Over 250 teachers and students attended the one day event at UNH. They were treated to hundreds of maps created by various groups showing an infinite array of ways to display marine related data. Several colleges were on hand to provide information to the students about the programs they offer to help launch students into geospatial careers. Anne Witzig, a high school science teacher at the Essex Agricultural and Technical High School in Hawthorne, MA brings her Marine Biology Students here every year to learn about how to use GIS, Geographic Information Service to map the migration of whales up and down the east coast.

UNH Center for Coastal and Ocean Mapping & Joint Hydrographic Center

UNH Center for Coastal and Ocean Mapping & Joint Hydrographic Center is a national center for expertise in ocean mapping and hydrographic sciences. It is housed within the Ocean Engineering Department and it has grown from 12 people when it started in 2000 to more than 50 people now. With the $2 million addition scheduled to be built in 2007, that number will grow.

The JHC & CCOM hosts a "Telepresence Center" that links with shipboard scientists such as Dr. Robert Ballard at URI. The JHC assists with real time data processing of the bottom surveys that Ballard and crew conducted this past summer. Those data were transmitted to UNH, processed and sent back, live for the scientists and ship's crew to make decisions about where to deploy additional bottom sampling equipment. This is one of many cutting edge research projects underway at the center. Lead by Andy Armstrong and Larry Mayer, both centers are forging ahead to attract the best and the brightest to the field of hydrograhy. Guided by a Memorandum of Understanding with the National Oceanic and Atmospheric Administration (NOAA), the JHC operates in partnership with NOAA's National Ocean Service. The CCOM is a University center that expands the scope of interaction and cooperation with the private sector, other government agencies and universities. In addition to NOAA support, CCOM currently has projects underway funded by the US Geological Survey, the Office of Naval Research, the Naval Research Lab, DARPA, NSF and several private sector partners. The centers focus their activities on two major tasks, an educational task, aimed at creating a learning center that will promote and foster the education of a new generation of hydrographers and ocean mapping scientists, and a research task aimed at developing and evaluating a wide range of state-of-the-art hydrographic and ocean mapping technologies and applications.

Newfoundland & Labrador, Canada
Ocean Technology Sector

Newfoundland and Labrador Ocean Technology Sector

A vast, resource-rich expanse of ocean has shaped the history, culture and economy of the province of Newfoundland and Labrador for centuries. That undeniable attachment to the sea, combined with the steadfast determination and creativity of its people, has placed Newfoundland and Labrador at the forefront of Canada's ocean technology industry. From offshore systems evaluation to underwater acoustics and integrated marine navigation, the province's ocean technology enterprises are achieving worldwide prominence.

Industry Profile

Newfoundland and Labrador is home to approximately 45 knowledge-intensive, small and medium-sized enterprises developing innovative ocean technology products and services for niche markets in Canada, the United States, Europe, Central and South America and Asia. These companies employ approximately 1,000 workers and generate total estimated revenues in the order of C$250 million.

Provincial Profile

- ***Most Easterly Province in Canada***
- ***Time Zone: EST + 1.5 hrs***
- ***Population: 515,961*** *(2005)*
- ***Capital City: St. John's Population: 182,485*** *(2005)*
- ***Total Coastline: 17,542 kms***
- ***Gross Domestic Product*** *(2005)**: C$22.3 Billion***
- ***Estimated GDP Growth 2006: 6.2%*** *(highest of all Canadian provinces)*

Ocean Technology Expertise in Newfoundland and Labrador

Ocean ICT and Marine Operations:

- ***Instrumentation / communication***
- ***Underwater acoustic technologies***
- ***Ocean mapping / sonar technologies***
- ***Remote sensing / radar technologies***
- ***Electronic charting, integrated marine navigation and course prediction systems***
- ***Wireless biotelemetry species monitoring systems***
- ***Marine geomatics***
- ***Ship voyage data recorder technology***
- ***ROV technology, underwater robotic control***

Ocean Technology Development and Marine Services:

- ***Numerical and physical modeling and testing***
- ***Boatbuilding, fabrication and repair***
- ***Fishing vessel design***
- ***Geotechnical services, marine weather and sea state forecasting***
- ***Marine transportation, port operations and cargo handling***
- ***Security technologies and ocean surveillance***
- ***Renewable ocean energy systems***
- ***Escape, evacuation, survival, safety and rescue solutions***

Clusters of Expertise, Partnership and Collaboration

St. John's, the capital city of Newfoundland and Labrador, boasts a mature and comprehensive concentration of marine technology research and development performers and companies. Much of the capacity is co-located within just a few city blocks, forming a unique environment conducive to intellectual and entrepreneurial interaction. This clustering of small and medium-sized enterprises, research facilities, educational institutions, municipal, provincial and federal infrastructure and related personnel has created tremendous synergy and encouraged a culture of collaboration.

Our world-class research and development infrastructure has created a cluster of ocean excellence. In fact, a key ingredient of our success is a unique partnership of companies, institutions and government agencies called Oceans Advance. This multi-stakeholder innovation cluster initiative facilitates world-class capability and aims to make the St. John's region an international location of choice for ocean technology.

Infrastructure, Research and Development

The Centres of Excellence, a term used to describe Newfoundland and Labrador's key ocean technology research and development facilities, serve as a backbone of the ocean technology community. These Centres, all located near or within Memorial University of Newfoundland, provide fundamental research, technology development expertise, industry incubation, testing, training and scientific validation services.

Facilities such as the National Research Council-Institute for Ocean Technology evaluate the design of vessels and offshore structures in its ice tank, towing tank and offshore engineering basin. Memorial University's Ocean Sciences Centre is a leading Canadian cold oceans research facility.

That's just the tip of the iceberg, so to speak. Many of these facilities are one of a kind and cater to an international clientele that includes port authorities, fisheries departments, coastguards, and academic institutions. In fact, we have all the unique ingredients of history, culture, economics and resources that few other places in the world can bring together in one marine and ocean technology focused location.

Newfoundland and Labrador has positioned itself as a high quality, innovative, and reliable supplier of specialized marine and ocean technology products and services to national and global markets. Our interest for the future is not only developing new technologies but to develop and provide integrated management solutions for the pursuit of the environment, resource extraction and resource management.

Canadian Centre for Fisheries Innovation ____ ***www.ccfi.ca***

Canadian Centre for Marine Communications ____ ***www.ccmc.nf.ca***

C-CORE ____ ***www.c-core.ca***

Faculty of Engineering & Applied Science – MUN ____ ***www.engr.mun.ca***

Marine Institute – MUN ____ ***www.mi.mun.ca***

Offshore Safety and Survival Centre ____ ***www.mi.mun.ca/ossc***

Centre for Marine Simulation ____ ***www.mi.mun.ca/cms***

Centre for Aquaculture and Seafood Development ____ ***www.mi.mun.ca/casd***

MI International ____ ***www.mi.mun.ca/mi_international***

Centre for Sustainable and Aquatic Resources ***www.mi.mun.ca/csar***

National Research Council Canada - Institute for Ocean Technology ____ ***www.iot-ito.nrc-cnrc.gc.ca***

Ocean Sciences Centre – MUN ____ ***www.osc.mun.ca***

For further information about the ocean technology sector in Newfoundland and Labrador contact:

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The Cerberus Wideband

Swimmer Detection Sonar

By T. Clarke, A. Webb, C. Minto and D. Stanhope (QinetiQ)

Over recent years the problem of diver detection has received renewed interest, with many systems being available around the world that advertise a swimmer/diver detection capability. However, the problem of diver detection is considered to be one of the most challenging problems in underwater acoustics, particularly when associated with small target strength divers, such as re-breathers, in acoustically loud and variable environment, such as a harbor. This paper presents a number of requirements and difficulties for diver detection, which a competent system should be able to mitigate against. The paper also presents the QinetiQ solution to these requirements in the form of Cerberus and how the use of state of the art advances in wideband technology, tracking and classification algorithms can be used with a simple human machine interface and compact design to meet the requirements.

Figure 1 (pg. 38) show the key elements of the Cerberus swimmer detection sonar (SDS), with the offshore unit (OSU) on the left hand side, consisting of the transmit/receive arrays and electronics. On the right hand side is the operator display that has been designed such that minimal interaction and expertise is required by the operator.

Benefits of Wideband

One of the most important advances in underwater acoustic systems in the past 10 years is the development and practical implementation of wideband sonars. This development is fast becoming the baseline entry point for modern sonar, both for military and commercial systems. QinetiQ have been at the forefront of such systems having provided the research and development components for the UK MoD. Wideband Sonars offer two key advantages over conventional systems and can be summarized as follows:

- improved resolution,
- improved performance and reverberation rejection

Resolution

The temporal and range resolution of signal processing systems is implicitly linked to the bandwidth of the transmit signal and the type of receiver processing. For example, conventional narrowband/FM sonars with a bandwidth of 2kHz have a maximum range resolution of 37.5

Cerberus over the sea.

cm, whereas a wideband sonar of bandwidth 20kHz has a range resolution of 3.75 cm. The difference in performance is illustrated in Figure 2 (pg. 38), which shows the resolution provided by a 2 kHz and 20 kHz bandwidth sonar for a typical threat object. Note that the wideband sonar fully resolves the three highlights, whereas the narrowband sonar does not. This difference in resolution can be considered to be equivalent to bringing the underwater picture into focus at the level required for diver detection and classification providing a major improvement in classification due to the resolved highlight structure.

Design Characteristic

The performance of active sonar systems is dependent upon the level of rejection of reverberation and background noise. Figure 3 (pg. 39shows an example of the received signal from the environment (44 pings worth of data) that the sonar must detect against. Note that the received signal is a mixture of reverberation created by the sonar transmission from the sea bed/surface boundaries and background noise. Figure 3 shows a high initial reverberation level that decays with time into the noise background. Therefore, any system fit for the purpose of swimmer detection must be able to cope with high reverberation and high noise. Noise performance is governed by signal energy into the water and receiver directivity index whereas reverberation performance is governed by receiver azimuth beam width and range resolution.

Therefore, the benefit of wideband system is clear since long pulses can be transmitted (to maximize the energy into the water — good performance against noise), with a high bandwidth (to maximize sonar resolution — good reverberation and classification performance).

Design Requirements

The benefits of wideband in the undersea environment are self evident, with improved resolution and performance. However, this does not necessarily lead to the optimum design characteristics for a swimmer detection sonar. Armed with the characteristics of wideband, QinetiQ designed the Cerberus SDS in such a way that it was able to cope with the variety of environmental and threat conditions based on a number of requirements

The overarching requirement for a diver detection system is to be able to determine the presence of a threat diver at a sufficient range from the asset, such that a suitable deterrent process can be applied. These deterrent processes may range from simple underwater warnings through to more extreme measures. For useful implementation of deterrent procedures, a detection range, from the asset, in excess of 600 m is required. A number of key requirements are:

a) High water volume coverage rates:

It is not sufficient for a diver detection sonar just to have long detection range capability. The necessary condition for the sonar is to provide long detection ranges over the whole water column and to re-interrogate the whole water column at a fast rate. This is a necessary requirement since the re-interrogation rate (or ping rate) allows for reduction of false alarms and maintains a track on a threat which is current and accurate enough for deterrent procedures.

b) Low operator intervention rates:

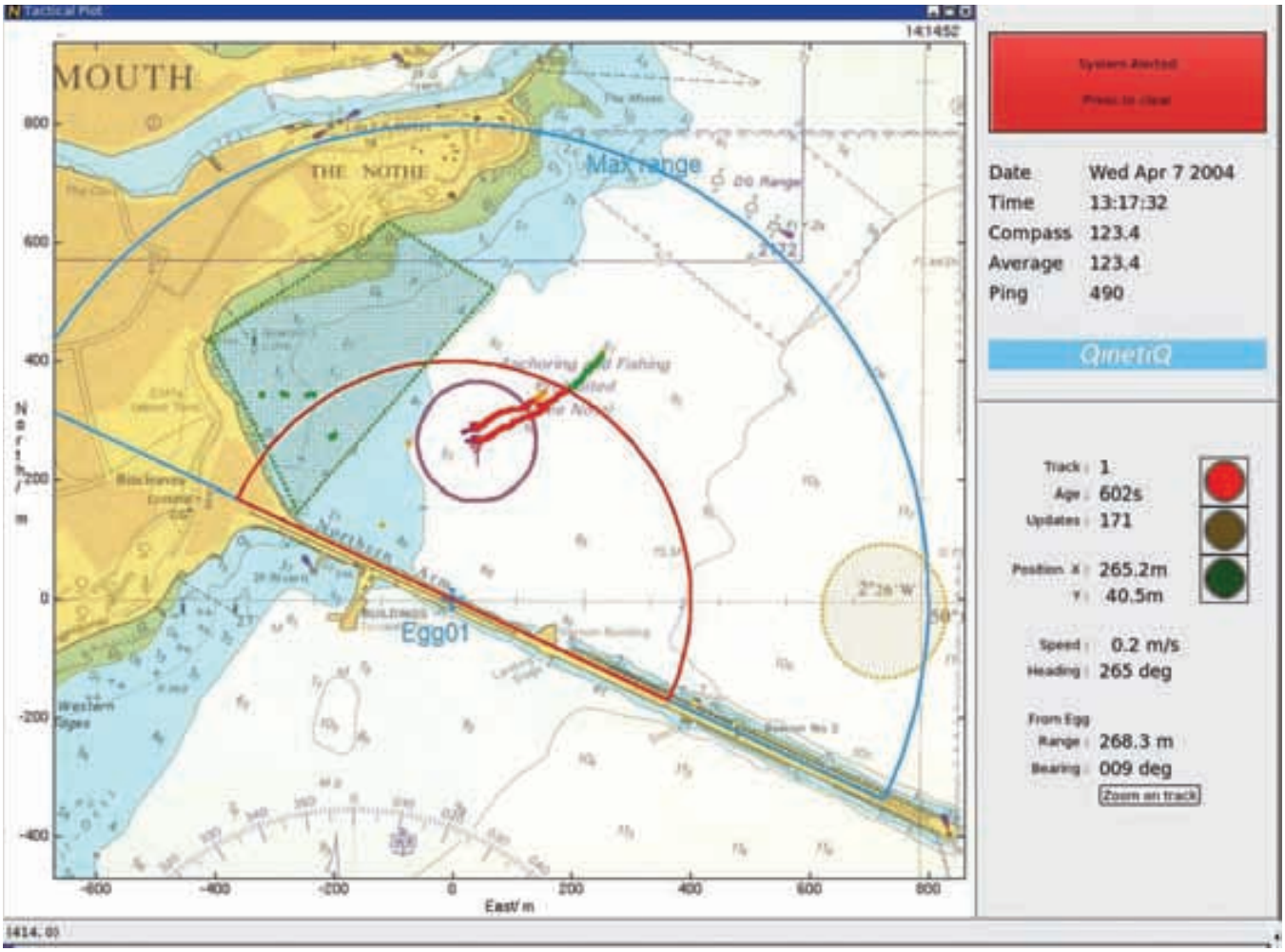
Modern swimmer detection sonars perform highly advanced signal and data processing to enhance diver detection. However, it is likely that the operators of the sonar could vary from highly experienced and trained users through to non-experts with little training. Since it is likely that SDS will be operated by the less experienced users, it is necessary for the system to be able to operate with little or no intervention, except when a real threat occurs. This puts a significant onus on the SDS designer in terms of style of display, the method of alerting the operator and the mitigation against false alarms, while still providing sufficient information to allow the correct decision to be made about the contact.

c) Ability to operate in challenging shallow/deep water environments with adverse sound speed profiles and high reverberation against all threat types:

The performance of an SDS system is dominated by the three parameters of system design, the environment and threat type. The parameters associated with the environment and the threat type can not be controlled and can be highly variable. Therefore, it is necessary for the system design to be sufficiently good and flexible that the majority of threat and environmental variations can be overcome. A number of harsh conditions would be high reverberation, adverse sound profile limiting performance, high noise levels and low target strength experienced with a re-breather diver.

d) Sufficient accuracy in bearing and range to allow deterrent procedures to occur:

Once a diver has been detected, it is necessary to position the location of the threat. This implies that both the



Diver track at Weymouth.

range and bearing resolution of the SDS is sufficient to provide location information and the position update rate is fast enough to be useful. With these requirements in mind it is considered that a bearing/range resolution of better than 2°/2m (in conjunction with a state of the art tracking algorithm) and ping update rate of better than 4s is required.

e) Single, compact unit able to work alone or with other units:

The variety of potential locations for SDS is large and therefore there is a requirement for the system to be compact and deployable in different water depths. The unit should be capable of being bottom mounted and ship deployed and also be able to work away from the asset to improve coverage around the area and/or maintain a barrier with additional units.

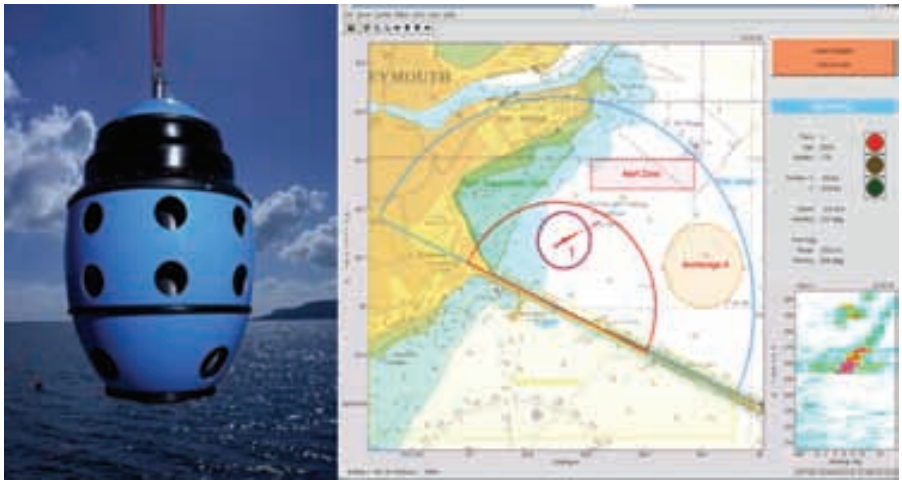
f) Easy deployment, recovery and maintenance:

SDS systems will spend many 1,000s of hours of operation before routine maintenance occurs. It is, however, important to develop a robust system which can operate for long periods and can be replaced quickly. Easy deployment and recovery are, therefore, essential features of SDS systems. In addition, malfunctions of the system may not necessary impact greatly on the performance since the level of redundancy should cope, however, it is important that the users know if/when a system needs immediate maintenance or replacement.

g) Low environmental impact:

All man made sound impacts on the environment and the current trend is that legislation on underwater acoustic transmission will increase. Therefore, it is of increasing importance that designers of SDS systems are aware of the effects of their system on marine life such

Figure 1



Cerberus OSU and operator display

that they produce minimum environmental impact.

Build Characteristics

QinetiQ have developed the Cerberus wideband swimmer detection sonar in response to the challenging requirements defined in the previous section. The development of this product is based on years of experience of wideband technology, state of the art tracking and classification algorithms. QinetiQ also has a large background knowledge of environmental conditions which affect performance, sonar design, build expertise and user interface experience.

Wideband

Cerberus has been designed specifically for the task of tracking divers in hostile conditions. This, together with it's heritage as a 360° wideband sonar that has been derived from decades of underpinning research into the detection, tracking and classification of low target strength objects, gives the device both an exceptional and unprecedented circular area of coverage per unit and an important full water column coverage in hostile deep and shallow water environmental conditions. Wideband technology is required to counteract the problem of detection of low target strength threats where older CW/narrowband systems have proved inadequate.

While the importance of wideband technology has been known for many years, it is only in recent times that sonar systems have been capable of transmitting/receiving such signals at sufficiently high power to make it worthwhile. The major development in this area has been the underpinning enabling technology of 1-3 Piezocomposites, allowing signals of high bandwidth to be transmitted and received.

Open System

The Cerberus System operates on the QinetiQ DeRSCI open architecture methodology that has a proven track record on U.K. Royal Navy submarines. The use of such open and scaleable standards simplifies considerably the ease with which systems can be constructed and controlled with little or no bespoke engineering.

Adverse Conditions

The design and build of Wideband Cerberus has been such that environmental effects such as adverse sound speed profile are overcome by the use of wideband technology and wide vertical field of view. Figure 4 (pg. 39) shows the importance of the sound speed profile for detection performance with, for this case, the environment producing downward refraction. The Cerberus wideband wide field of view design provides full water

Figure 2

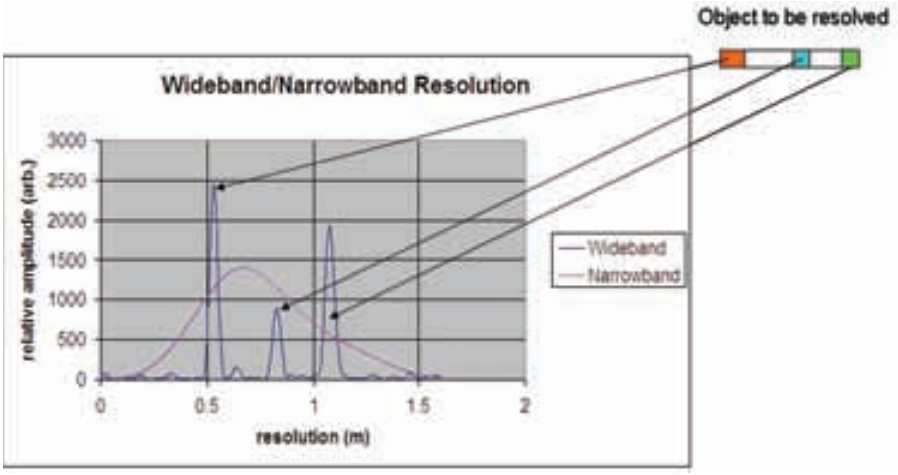
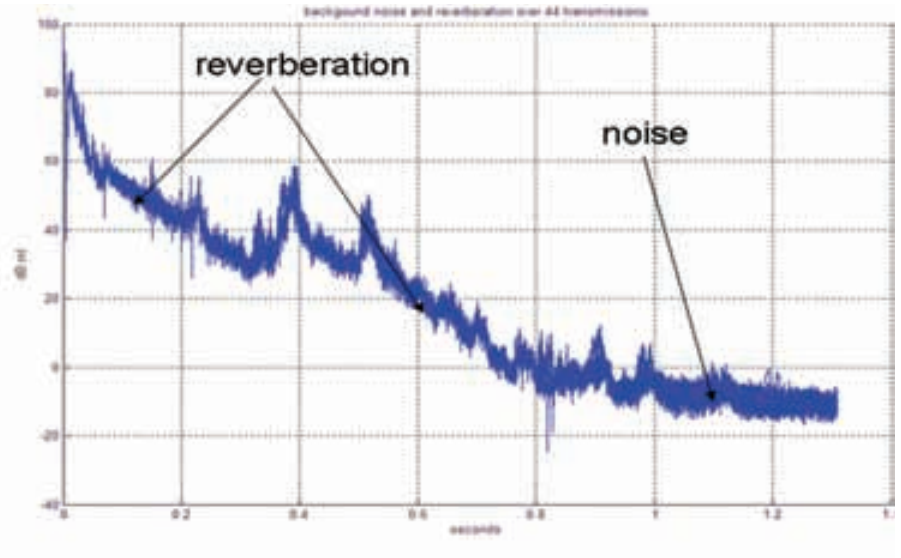


Illustration of Resolving Power of Wideband Sonar.

Figure 3



Example of Reverberation and Noise Background.

volume coverage whereas the CW narrow beam sonar can only provide much smaller coverage (Figure 4). The Cerberus system therefore has two advantages over the narrowband system in that:

- There is no need for operator expertise and intervention to optimise the sonar setting
- Cerberus maintains high performance across the entire volume in a single ping due to wideband processing technology

Human Machine Interface

The Cerberus human machine interface has been designed specifically for ease of use by operators with limited training to provide a clear picture of the underwater environment. Figure 1 gives the main Cerberus display showing the overlay of the acoustic environment with geographic map and known features. The display also provides the intruder target track (1) speed and location and a traffic light system is used indicating whether the contact is threat or not. Because of the high resolution capability of wideband sonar, the system is also capable of providing a high resolution image of the threat at long range (see bottom right on Figure 1).

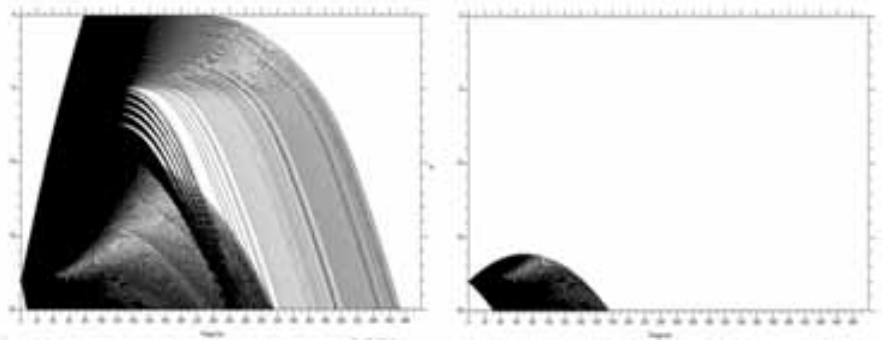
Multi-Unit Operation

Cerberus is designed to work alone or as part of a multi-unit barrier defense, without loss in performance of individual units. This is an important criterion in SDS systems since the design and use of a barrier with sonar systems must mitigate against the mutual interference between adjacent units and an ill-conceived method of operation can reduce individual unit performance enormously. A common method of operation of multi-units is to use time discrimination between adjacent units, e.g. each system transmits and receives alternatively. This, however, has the unwanted effect of reducing the pulse repetition rate by one-half and requires cross-communication between units to maintain synchronization. The Cerberus units operate in dual mode by using frequency band splitting method, where each individual unit uses a 20kHz section of the total available bandwidth (unit 1 80kHz-100kHz and unit 2 100kHz-120kHz). The benefit of this approach is that each unit can operate independently of the other and can maintain the single unit pulse repetition rate.

Deployment

The acoustic and mechanical design of Cerberus has allowed for a variety of deployment options from sea bed mounting, deployment from a crane (either from a jetty or ship) or through the ship hull. In each case the basic Cerberus unit remains the same and only minimal modifications are required.

Figure 4



Raytrace for Downward Refracting Sound Speed Profile for Cerberus Vertical Field of View (left hand side) and narrow field of view sonar (right hand side).

Performance and Tracking

The Cerberus SDS has provided exceptional performance in a wide variety of deployments around the world, providing long-range detection performance of 900 m using wideband technology.

Wideband technology can be considered to provide a highly focussed picture of the undersea environment and the enhanced picture quality is a vast improvement over narrowband systems, allowing more accurate classification and tracking to occur.

With this improved picture quality comes the ability to see and resolve many more undersea objects, which, if moving, could provide the operator with many false targets cluttering the display.

In reality, the implicit performance and resolution of Cerberus was so good that the early versions of the display and tracking software resulted in many false alerts in cluttered waters due to the detection of small non-diver objects moving in the water.

These issues were soon overcome by designing a combined tracker/classification approach that used the target structure and motion to eliminate false targets. This allows the operator to be provided with a display containing only track data from likely threats.

Summary

This paper shows the benefits of wideband systems for the purpose of diver/swimmer detection and provides details of the design of the Cerberus wideband SDS developed by QinetiQ.

The paper shows that good detection range is a necessary requirement of such a system. However, it is also shown that detection range performance should be ranked equally with water volume coverage, water volume interrogation rate, classification performance and the need for an intuitive and simple display.

Each of these requirements, in addition to others given in the paper, has driven the design of the Cerberus SDS system and the key benefits are summarised below:

- **Long Range Detection of threat.**

Advanced 20 kHz Wideband pulse compression signal processing techniques maximise the range at which low echo strength targets may be detected — a huge leap over conventional single frequency narrowband processing. The benefit returned to the operator is a maximized time to respond with the best opportunity for prosecution.

- **Accurate target localization and classification.**

As well as enhancing achievable range, wideband processing also returns a phenomenal 3cm range resolution allowing accurate classification. An optimal 360° narrowbeam design with fine bearing estimation ensures that targets are located to within 0.5°. The resulting target location can be accurately utilized for intruder interception.

- **Performance in challenging Environments.**

A wideband design minimizes both the problem of reverberation and noise allowing the use of an acoustic implementation suited to the task rather than constrained by the technology. Consequently improved operating performance in challenging environments (including shallow water), is achieved.

- **Full Situational Knowledge.**

Cerberus sports a 360° / 180° beam formed design, updated every three seconds, over ranges of up to 1km, equivalent to 3 sq. km. or 2 sq. miles per ping. The ability to fully adapt transmissions in multiples of 30° ensures that a single Cerberus installation provides the widest possible coverage in any given situation.

- **Low operator intervention.**

A sophisticated tracking system distinguishes between threats and non threats, seabed background targets, surface craft, other underwater life forms and even local flotsam. The success of the tracker removes the need for a dedicated skilled operator making the system easily integrated with the tasks of existing security operations.

- **Low cost of ownership.**

The potential for wide area unit coverage ensures that Cerberus meets requirements for low initial capital costs for a given installation. QinetiQ's product engineering program dedicated to reliability delivers a system with low maintenance requirements and simple corrective actions.

- **Simple to interface.**

The Cerberus output is easily connected to a local TCP/IP Ethernet offering the opportunity to interface to an existing Command and Control or multi sensor security system.

Simple to expand. The inbuilt ability to share operating frequency space with neighboring Cerberus units prevents mutual interference and ensures maximum system performance without the need for time space separation and reduced update rate that narrowband systems suffer.

MARINE TECHNOLOGY REPORTER 2007 EDITORIAL CALENDAR

JANUARY

AD CLOSING DATE: December 15, 2006

FEATURE: **Seafloor Engineering**
Discovering & Recovering information from the ocean's depths requires increasingly advanced engineered solutions

PRODUCT REVIEW: **Commercial Diving**

DIRECTORY: **Salvage Vessels & Equipment**

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Underwater Intervention (UI) 2007 Jan. 30-Feb. 1
New Orleans, LA

Deepwater Operations Conference & Exhibition 2007 Jan. 23-25
Galveston, TX

MARCH

AD CLOSING DATE: February 16, 2007

FEATURE: **AUVs • ROVs • UUVs**
Sophisticated & Rugged, MTR examines the latest advances in machines designed to explore and work under water

PRODUCT REVIEW: **Undersea Defense Products**

DIRECTORY: **Communication Systems**

REGION FOCUS: **United Kingdom**

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Ocean Business 2007
March 27-29, 2007
Southampton, England

Offshore West Africa Conference & Exhibition
March 20-22
Abuja, Nigeria

OMC 2007 Offshore Mediterranean March 28-30
Ravenna, Italy

Sea Asia April 2-4
Suntex, Singapore

4th China International Offshore Oil & Gas Exhibition
April 3-5
Beijing, China

Sea, Air & Space
Washington, DC

APRIL

AD CLOSING DATE: March 16, 2007

FEATURE: **Offshore Technology Edition**
Emerging undersea technologies aid in the discovery and recovery of oil and gas

PRODUCT REVIEW: **Sonar Systems & Seafloor Mapping**

DIRECTORY: **Environmental Monitoring & Remote Sensing**

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Offshore Technology Conference (OTC) 2007
April 30 - May 3, 2007
Houston, TX

MAY

AD CLOSING DATE: April 13, 2007

FEATURE: **Undersea Defense Edition**
Governments increasingly deploy undersea technology to keep ports and ships safe

PRODUCT REVIEW: **Offshore Oil & Gas**

DIRECTORY: **Undersea Defense Products**

COUNTRY FOCUS: **Canada**

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SubOptic 2007 May 14-17
Baltimore, MD

Oceans 2007 June 18 -21
Aberdeen, Scotland

Brasil Offshore June 19-22
Macae, Brasil

NorShipping 2007 June 12-15,
Oslo, Norway

JUNE

AD CLOSING DATE: May 11, 2007

FEATURE: **Renewable Energy**
From undersea mining to generating power from waves, MTR looks at emerging technologies to harness undersea resources

MARKET: **Research Vessel Technology**

PRODUCT REVIEW: **Undersea Vehicles & Imaging**

DIRECTORY: **Communicatons, Telemetry & Data Processing**

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SubSeaTECH 2007: International Conference on Subsea Technologies June 25-28
St. Petersburg, Russia

ISOPE-2007: 17th International Offshore and Polar Engineering Conference & Exhibition July 1-6
Lisbon, Portugal

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MARINE TECHNOLOGY REPORTER 2007 EDITORIAL CALENDAR

JULY

AD CLOSING DATE: June 15, 2007

FEATURE: **The MTR100**
Marine Technology Reporter ranks and rates the top 100 companies serving the undersea technology marketplace.

PRODUCT REVIEW: **Deck Machinery, Ropes, Cables & Connectors**

DIRECTORY: **Electronic Charting & Vessel Management**

REGION FOCUS: **West Coast North America**

SEPTEMBER

AD CLOSING DATE: August 17, 2007

FEATURE: **The Ocean Engineering Edition**
MTR presents insights on the worlds most innovative commerical, military and scientific undersea system developments

PRODUCT REVIEW: **Power Systems & Products**

DIRECTORY: **OceanTech '07 Exhibitor Guide**
Profiles of every company exhibiting at OT'07

REGION FOCUS: **New England**

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OceanTech Expo
Providence, Rhode Island
October 2-4, 2007

UUVS - The Unmanned Underwater Vehicle Showcase
September 2007
Southampton, UK

US Maritime Security Expo
September
New York, NY

SNAME 2007 November
Fort Lauderdale, FL

OCTOBER

AD CLOSING DATE: September 14, 2007

FEATURE
THE ANNUAL WORLD YEARBOOK

The undersea technology market's largest and best-read annual report. MTR's Annual Double-Edition, focused on **Military** • **Offshore** • **Scientific** ... MTR editors deliver exclusive market insights and projections regarding the direction of business for the coming year

PRODUCT REVIEW: **Undersea Cameras & Lighting**

DIRECTORY: **Deck Machinery, Ropes, Cables & Connectors**

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SNAME 2007 November 13-17
Fort Lauderdale, FL

☆PLUS: **The MTR 2007 Directory and Buyer's Guide**

NOVEMBER

AD CLOSING DATE: October 12, 2007

FEATURE: **Undersea Science**
MTR taps the top minds in marine science to deliver details on the world's most challenging undersea studies

PRODUCT REVIEW: **Salvage Vessels & Equipment**

DIRECTORY: **Undersea Vehicles & Imaging**

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The International Workboat Show November
New Orleans, LA

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Obituary: Fred N. Spiess

Pioneer in Ocean Technology

Fred Noel Spiess, a world-renowned deep-sea ocean explorer and inventor at Scripps Institution of Oceanography, University of California, San Diego, died Friday, Sept. 8, 2006, in UC San Diego's Thornton Hospital in La Jolla, Calif. The cause of death was cancer. Born in Oakland, Calif. on Christmas Day, 1919, he was 86 years old.

Spiess had been affiliated with Scripps Oceanography since 1952. He was a professor emeritus of oceanography in the Marine Physical Laboratory (MPL) at Scripps and had a long and successful scientific career that spanned more than 50 years.

Spiess was widely known for his contributions to the development of innovative ocean technology. He was tireless in defining new ways to look at the deep ocean and seafloor. He designed and built instruments, took them to sea for deployment and led numerous expeditions to investigate the deepest parts of the world's oceans. He was co-inventor of the one-of-a-kind FLIP, the Floating Instrument Platform.

"We are deeply saddened to hear of Fred Spiess's passing," said Marye Anne Fox, chancellor of UC San Diego. "Fred was a brilliant innovator in ocean science who dedicated decades of enthusiastic leadership to the development of UC San Diego and to the University of California. Through his participation on numerous committees over the years, he has helped UC San Diego become a national academic and scientific leader. Today, our hearts go out to his family as we mourn his loss and express our deep appreciation for his devoted years of service."

Fred Spiess

"Fred Spiess was the embodiment of an oceanography pioneer and his influence in marine science will be remembered forever," said Charles Kennel, director of Scripps Oceanography. "On the Scripps campus he will be celebrated as someone who made the type of pivotal contributions that made this institution a world leader in its first 100 years. Everyone at Scripps will miss his academic eminence, his personal integrity and his friendly demeanor and smiling face."

Spiess received his A.B. degree in physics from UC Berkeley in 1941, and received a U.S. Navy commission at the same time. During World War II he completed 13 war patrols in submarines in the Pacific Ocean and won the Silver Star and Bronze Star. He held the rank of captain (retired) in the U.S. Naval Reserve until his death.

After the war, Spiess attended Harvard University, receiving his M.S. degree in communication engineering in 1946. He then returned to UC Berkeley for graduate study in physics, where he conducted research under Emilio Segré in the area of short-lived alpha decay problems and high-energy particle scattering and absorption.

He completed his Ph.D. degree in 1951, then worked briefly for General Electric's Knolls Atomic Power Laboratory in Schenectady, NY. In 1952 he joined the Marine Physical Laboratory (MPL) at Scripps and was director of MPL from 1958 to 1980.

He spent the year 1962-63 as acting director of Scripps and was director for the academic year 1964-65, following Roger Revelle's resignation and preceding the appointment of William A. Nierenberg. He was then an associate director of Scripps until 1980. He also served as chairman of the Scripps Graduate Department in 1963-64 and 1976-77. During 1974-75, while on leave from Scripps, he was a scientific liaison officer for the Office of Naval Research in London.

From 1980 to 1988 he was director of UC's Institute of Marine Resources (IMR), headquartered at UC San Diego, retaining his faculty association with Scripps and continuing his research in MPL. As director of IMR, the university's only statewide marine science unit, Spiess

Phillip Rudnick, Fred Fisher, Fred Spiess in 1961.

coordinated a diversity of research interests at the inter-disciplinary institute concerned with research, education and public service in relation to society's uses of the resources of the sea.

Spiess was the co-designer, along with Fred Fisher and Phillip Rudnick, of FLIP, a 355-foot long, non-propelled research vessel. This unique research craft "flips" from a horizontal to a vertical position to form a steady platform for research at sea. In 2002, FLIP marked 40 years in active service at Scripps. At the time of his death, Spiess was involved in arranging for the use of FLIP as a testing and demonstration platform for research and engineering systems to be deployed in ORION (Ocean Research Interactive Observatory Networks), a new ocean observations program.

Spiess was a seagoing scientist, leading an average of two expeditions a year for more than 40 years. His research interests included studies of long-range propagation of sound and related underwater communication systems, ocean-going stable platforms and deep-towed instrument systems, fine-scale properties of the deep seafloor, phenomena associated with plate tectonics and seafloor spreading and seafloor geodesy.

In 1989 he led the development of a wireline re-entry system to carry research instruments from the deck of a ship through 5,000 m of seawater and into seafloor boreholes previously drilled as part of deep-sea scientific drilling programs. He conducted the first, highly successful use of the system off Florida during a cruise of the Scripps research vessel Melville. He continued to lead the refinement and use of this capability, with a 2001 expedition on R/V Revelle making the first wireline installation of thermistor strings in drill holes to study the circulation of fluids in the earth's crust.

Spiess was principal investigator for several programs at the East Pacific Rise (EPR) and the Mid-Atlantic Ridge. He led an international expedition to the EPR at 21 degrees north in 1979, when hot springs, oases of unusual marine life and rare mineral sulfide deposits were discovered at depths of 2,600 meters.

Spiess worked on the development of seafloor search technology and in 1971 led a successful deep-sea expedition that located and mapped the wreckage of five ships previously scuttled by the U.S. Navy. He also carried out National Science Foundation-supported manganese nodule surveys, Navy-sponsored studies of the acoustic properties of the deep seafloor and a variety of geological and geophysical expeditions in the Pacific, Atlantic and Mediterranean oceans. He pioneered the development of seafloor geodesy, developing and proving techniques for measuring positions on the deep seafloor with centimeter repeatability.

Spiess wrote numerous technical articles on subjects in marine physics and ocean engineering. He served on a variety of advisory committees and study groups, including the Naval Research Advisory Committee; the Defense Science Board; the National Academy of Sciences' committees on undersea warfare, oceanography and geodesy; the steering committee for the NSF RIDGE program; and advisory committees for marine programs at UC Santa Cruz, UC Santa Barbara, the University of Miami and Woods Hole Oceanographic Institution.

He was chair or co-chair for more than 20 successful Ph.D. candidates, four of whom are now full professors in the University of California system.

He was a fellow of the American

Fred Spiess, David Chadwell, John Hildebrand.

Geophysical Union, the Acoustical Society of America and the Marine Technology Society, and a member of the Maritime Historical Society, the Society for Industrial Archeology, Sigma Xi and Phi Beta Kappa. During 1990-92 he was president of the Ocean Sciences section of the American Geophysical Union and chaired its Fellows Committee in 1994-96. He was also an active member of the Scholia Club of San Diego.

In 1965 he was awarded the Franklin Institute's Wetherill Medal for his role in the development of FLIP. He received the Marine Technology Society's Distinguished Achievement Award in 1971. He was presented the U.S. Navy's highest award for scientific achievement, the Captain Robert Dexter Conrad Award, in 1974 for "outstanding achievement in planning, conducting and administration of research and development."

In 1980 the American Association for the Advancement of Science awarded Spiess and his coauthors the Newcomb Cleveland Prize for the outstanding paper published in Science that year. In 1983 he received the Maurice Ewing medal from the American Geophysical Union and the U.S. Navy for outstanding contributions to marine geophysics. In 1985 he was awarded the Acoustical Society of America's Pioneers of Underwater Acoustics medal and the Lockheed Award for Ocean Science and Engineering from the Marine Technology Society.

In 1985 he was elected a member of the National Academy of Engineering for significant breakthroughs in ocean engineering, including the development of FLIP, Deep Tow and precision benthic navigation. In 1990 he received the Navy Distinguished Service Award for leadership in ocean technology. Most recently, he was awarded the 2006 Distinguished Technical Achievement Award from the Oceanic Engineering Society of the Institute of Electrical and Electronics Engineers "for six decades of advances in ocean engineering while developing sea-going research tools." His daughter Kathy Dallaire will accept the award on his behalf on September 20.

Spiess served the University of California Academic Senate both locally and UC-wide. At UC San Diego, he was chair of the Committee on Planning and Budget during 1986-88, the Graduate Council in 1983-84, the Committee on Privilege and Tenure in the 1970s and chair of the San Diego Division in 1985-86. He served as vice chair and chair of the UC-wide Academic Council and Assembly in 1988-89 and 89-90, respectively, including acting as one of the two faculty representatives on the UC Board of Regents during that period. From 1998 to 2001 he chaired the UC Academic Senate Task Force for the startup of UC's new campus at Merced. His contributions in this arena were recognized in 2000 with the Oliver Johnson Award for outstanding service to the Academic Senate. At Scripps he served on and chaired many committees, including Scripps Staff Council (1962-64). He was a leader in the restoration of the historic Old Scripps Building, including serving on the Building Restoration Committee (1976-87). He was awarded the UC San Diego Campus Ministry Award for academic leadership in 1989.

In addition to his university and civic activities, he was the moderator of the Congregational Church of La Jolla during 1984-85, and served for many years as the church's financial secretary.

Mocniak Named CFO at Phoenix

Phoenix International, Inc. appointed Lawrence G. Mocniak as its Chief Financial Officer (CFO). Mocniak will oversee all aspects of Phoenix's financial management and control, government procurement, financial reporting, and capital investment initiatives. Prior to joining Phoenix, Mocniak was the CFO of a government security solution company; a director of business management for a publicly traded telecommunications software and services company, and he spent 16 years at an international marine services company in managerial positions of increasing responsibility to include liaison controller. Mocniak is a member of the Institute of Management Accountants and the Association of Financial Professionals. He holds a bachelor's degree from Robert Morris University.

MacArtney Opens New Calibration Facility

The MacArtney Group can now offer calibration and maintenance services of Oceanographic and Hydrographic instruments. This service is available from its branch office MBT - Meerestechnisches Büro Turla GmbH in Kiel, Germany. MBT has taken over the calibration facility and the maintenance contracts from Raytheon Anschütz, and is servicing a large number of naval customers throughout the world. A few of the services offered include: Calibration of CTD probes, Calibration of Sound and Velocity Sensors; Diagnostics of current sensors; Diagnostics of Laser Particle Analyzers; and Diagnostics of Nutrient Analyzers.

IXSEA UK MD Honored

Richard Binks, IXSEA's UK Managing Director, was honored as a fellow for the Society of Underwater Technology (SUT), in recognition of both the help he has given the society and to his experience in underwater technology. Binks sat on the Society's main committee for four years and is still part of its International Committee. Binks heads up both of IXSEA's UK offices and has recently recruited two new sales managers to his team. The new Aberdeen office, in particular, is focused on developing IXSEA's products within the offshore industry. The network created by SUT is a good focus for IXSEA's growing capabilities in underwater positioning and survey.

Aker Kvaerner to Build Five Subsea Umbilicals

Rashid Petroleum Company (Rashpetco) awarded Aker Kvaerner a contract to supply five umbilicals to the Rosetta Phase 3 gas development in the Rosetta Concession, offshore the Nile Delta in Egypt.

The contract is valued at $20.1m. Work has already started on the steel tube umbilicals, totaling approximately 43 km in length to be manufactured at Aker Kvaerner Subsea's facility in Moss, Norway. Delivery is scheduled for the third quarter of 2007.

FarSounder Announces Patent

FarSounder announced the issuance by the United States Patent and Trademark Office of its second U.S. patent this year for its 3D Forward Looking Sonar Technology. "The FarSounder development team is excited about our latest patent," said Matthew J. Zimmerman, founder and VP of Engineering for the company. "This latest patent covers various aspects of our software processing technology." Zimmerman, along with engineers Evan Lapisky and Matthew A. Coolidge, contributed to this effort and continue to develop new technologies for the company. Used on commercial and private ships for obstacle avoidance and shallow water navigation, FarSounder FS-3 sonars are capable of generating a complete 3D image of the sea floor and in-water objects at navigationally signif-

Seaeye Doubles Sales, Expands

Sales success — quantified by a doubling of sales over the last 12 months and includes growing export sales that now exceed 70 percent of turnover — has led Seaeye to expand its operations by opening a second factory in Fareham. Extra engineering, technical and sales staff will be needed as the new 6,000 sq. ft. of additional space takes on final assembly of its electric ROV production. This leaves its existing factory to produce the building blocks that make up the underwater vehicles, such as frames, thrusters and control units. Training will also move to the new factory where, at a special facility, customers can receive technical training in the operation and maintenance of Seaeye's range of systems. This range meets the needs of all applications from observation and inspection, to seabed and pipeline survey, to a full work class capability for intervention in submarine rescue and the support of offshore drilling and IRM operations. Sales growth has come not only from the booming oil and gas industry, but also from the areas of defense, marine science and civil engineering. Seaeye say the demand for additional staff, ideally with ROV experience, will include mechanical and electronic design engineers along with senior sales management and staff.

icant ranges with a single ping. They are designed to offer visualization of a clear, easy to understand 3D sonar image. The standard user interface software includes automated alarms, BSB chart plotting capabilities, and GPS, compass, and depth sounder display capabilities.

Triton Imaging, Reson Sign OEM Agreement

Triton Imaging, Inc. and Reson A/S signed an OEM agreement under which Reson will resell Triton software bundled with Reson multibeam sonars. The Triton software available under the OEM agreement is the new Triton HydroBundle, a comprehensive hydrographic package that includes survey planning, real-time navigation, multibeam data acquisition, quality control (QC), data processing, map-based display, data fusion, and final product preparation and output. Real-time QC is performed by the unique Triton IntelliMon, a panel showing four statistical parameters: Along-Track Coverage; Effective Swath Width; Sound Velocity; and Rate of Change for attitude.

ODI Receives $4.5m Contract

Ocean Design, Inc. (ODI), a Teledyne Technologies Incorporated majority owned company that supplies subsea electrical and fiber-optic interconnect systems, announced that Aker Kvaerner Subsea AS awarded ODI a $4.5m contract for manufacturing and supplying the fully integrated fiber-optic communications connection system for its Reliance KG-D6 Subsea Production Control System. The Production Control System contract was awarded to Aker Kvaerner by Reliance in May 2006 as part of an engineering, procurement and construction contract to deliver an 18-well subsea production system for the deepwater Block KG-D6 gas development located off the east coast of India.

Revamped SV John Lethbridge Launched

IXSEA recently completed work on the SV John Lethbridge on behalf of Comex Deep Sea Salvage Limited (a wholly owned subsidiary of Subsea Resources PLC). The refit was undertaken by H2X shipyard in cooperation with IXSEA and Comex SA. The vessel is currently in the Atlantic working on a number of projects including the MIRANDA project (4,500 tons nickel) and the Ella project (a 19th Century bullion cargo). The survey ship is equipped with IXSEA-fitted sonar equipment that is

capable of surveying depths to 6,000 m as well as a Comanche Sub-Atlantic ROV, which can reach similar depths. The ROV has two work manipulators, HMI lights, digital cameras and flash and 100 kgf/ 200 lbf DC Thrusters.

The SV John Lethbridge is also equipped with an IXSEA positioning system including Posidonia USBL positioning system, PHINS 6000 subsea inertial navigation system and an OCTANS gyrocompass and full motion sensor. Comex SA, supervised the integration of the survey equipment with the ROV and also supervised the refit of the salvage ship. The refit was carried out by H2X, shipyard specialists in building, refitting and refurbishing oceanographic ships. This Mediterranean coast shipyard has more than 10,000 sq.-m. facilities,1,500 m of quays with dry-docks, and up to 2,000 tons lifting capacity. The SV John Lethbridge will have a crew of 20 as well as a 10-person survey crew.

Acergy Expands Capabilities

Schilling Robotics recently sold its ultraheavy-duty ROV system, the UHD 09, to Acergy, a seabed-to-surface engineering and construction contractor for the offshore oil and gas industry. The system is based on Schilling's standard UHD system, but incorporates features that are designed to enhance operational efficiency by allowing easy and flexible configuration for mission-specific tasks. The system will feature 150 shp and is rated for 3000-m operation. This marks the ninth vehicle order in Schilling's UHD product line. Acergy's purchase in March 2006 of two Schilling Robotics UHD systems, UHD 07 and UHD 08, marked the beginning of a collaboration between Acergy and Schilling to produce a new fleet vehicle for Acergy. Unlike the UHD 07 and 08 systems, however, the UHD 09 will be supplied without a tether management system (TMS). The vehicle will be specifically configured to support high-speed, low-noise, free-flying survey systems. The ROV system will be installed on Acergy's new vessel, the

Scuttlebutt

scuttlebutt \SKUHT-I-\, noun:
1. A drinking fountain on a ship; often stocked with strong rum.
2. A cask on a ship that contains the day's supply of drinking water.
3. Gossip; rumor. That ensues after a few sips of the drink

Justin Manley (right) of Battelle (Duxbury, Mass.) and his wife Paula welcomed a daughter, Rowan Elizabeth, on October 5. Justin reports that AUVs are much easier to debug than infants. **Brian Wilson**, formerly with Falmouth Scientific (Falmouth, Mass.) as of mid-November is Customer Service Manager at Hydroid, Inc. (Pocasset, Mass.) Webb Research, located in the Falmouth Technology Park in Massachusetts is expanding its facility, doubling building size to 14,500 total square feet and they are looking for an Engineering Manager as well as an Electronics Technician. http://www.webbresearch.com/careers.htm.

University of Maine, Orono's addition to their research vessel fleet. (Photo Credit: Maggie Merrill)

Please send your Scuttlebutt items to:

Maggie Merrill at martrep@aol.com

All items must be verifiable, brief, pre-press release and tasteful.

Acergy Viking, and will operate primarily in the Norwegian sector of the North Sea.

While all three ROV systems for Acergy will encompass the core UHD technologies, they will also benefit from Acergy's experience with component layout, frame design, and use of tooling packages. The final design will be tailored to Acergy's specific and exacting remote intervention and survey requirements.

Sonar, Cameras for New Fugro ROV System

Fugro has contracted Kongsberg Maritime to supply an extensive suite of cameras and scanning sonars for eight new Work Class ROV Systems, being produced by Fugro at its facility in Singapore. The package includes six new HDTV Color Zoom cameras for survey and intervention tasks as well as two additional suites of equipment for other parts of the Fugro ROV Fleet. Fugro plans to invest $38.4m before the end of 2007 to replace and update its existing ROV fleet. The new ROVs are designated FCV 1000 and FCV 3000. The underwater HDTV Color Zoom camera is designed to be used for all high-quality ROV inspection, intervention and survey tasks, as required by Fugros customers. The various video output options allow compatibility with existing ROV composite video transmission systems and HDV, DV or Firewire systems plus simple conversion to other alternative digital formats including HD-SDI.

In addition to HDTV video the camera has a 2.7 mega pixel digital still photographic capability. A water compensated optical zoom lens provides a close-up inspection capability combined with the flexibility of a 10x magnification for powerful stand off inspections.

CapRock Wins Tiburon Divers Contract

Tiburon Divers, a commercial diving company servicing the inland and offshore sectors, turned to CapRock Communications for satellite communications solutions, giving the company a critical lifeline between its offshore vessels and headquarters and a real-time communications for all onboard personnel.

Although initially awarded a contract for a single vessel, Tiburon quickly realized the benefits of broadband communications. Hence, the contract was signed with CapRock to outfit the entire fleet with a similar communications package. Under the terms of the agreement, CapRock will provide Tiburon's fleet of dive vessels with Voice over IP, Internet access and wireless access points supported by 24/7 customer service and network monitoring. Tiburon also uses CapRock's solutions to further enhance the services it provides to its customers while at sea. Always-on communications enable onboard customers to send and receive real-time information to and from experts onshore, resulting in quicker and more educated decision-making capabilities.

Marlink Teams for Arctic Ice Monitoring Buoy

Iridium Satellite, in conjunction with its service provider Marlink, is providing two-way data communications with a remote unmanned buoy measuring ice thickness in the Arctic Ocean as part of a program aimed at detecting climate change at high latitudes.

The Sea Ice Thickness Observation System (SITHOS) was developed by Christian Michelson Research (CMR), a Norwegian scientific research organization. It was deployed in late 2005 at 84 degrees north and 60 degrees west. The buoy contains sophisticated two-axis tilt sensors that measure the resonant frequency of deep-water waves under the ice. These waves are typically 300 m long and only one mm deep. The raw tiltmeter data is transmitted at intervals through the Iridium satellite network. The buoy acquires and transmits up to five hours of data for each measurement. By analyzing the movement of the deep-water waves, scientists can make accurate estimates of the thickness of the ice at the surface. The SITHOS buoy, encased in a hardened ruggedized capsule, was designed to be deployed by parachute, permitting it to be placed in locations that cannot easily be reached over the ice.

IXSEA's SHADOWS Honored

Robert Girault, COO, La Ciotat, Receiving the First prize in the GEP innovation awards

IXSEA CEO Thierry Gaiffe

IXSEA won first prize in the French offshore oil and gas industry's innovation awards in Paris on October 19. The GEP Prix de l'Innovation 2006 SME/SMI, which recognizes technological advancement in the industry as well as financial returns from the innovation, awarded this first prize to IXSEA for its Shadows sonar system.

SHADOWS, the first commercially available off-the-shelf Synthetic Aperture Sonar (SAS), is a high-performance sonar system with synthetic aperture processing, which offers top rated image quality in real-time with no gap at nadir boosting productivity.

"We would like to take this opportunity to thank the French Trade Association for the Oil & Gas Industry (GEP), which supports innovative companies working for the Offshore market," said IXSEA's CEO, Thierry Gaiffe. "Last year we were awarded second prize for our innovative GAPS acoustic positioning system, and now this year we are extremely honored to win this prestigious first prize for SHADOWS. This momentous occasion for IXSEA is clear recognition that we provide added value products for the oil and gas industry and we look forward to continuing to serve this market."

SHADOWS can be used for all sidescan survey applications including: cable route; offshore mining; pre-dredging survey; small objects search on the seabed; and shipwreck search and salvage.

Subsea Electronic Bottle Release System

Marine and environmental equipment specialist, OSIL (Ocean Scientific International Ltd.), has been appointed sole distributor of the new Subsea Electronic Bottle Release System (EBRS), a new way to collect calibration samples at depths for converting to Suspended Particulate Matter (SPM) (mg/l) and turbidity data. Specially designed to support the survey activities of the environmental and oceanographic industries, the Subsea EBRS features three water bottles held in a stainless steel frame with an onboard pressure sensor and optional turbidity sensor. The electronic surface control unit allows the bottles to be fired at a known depth and a simultaneous turbidity reading in Nephelometric Turbidity Units (NTU) can be taken. By collecting the water sample at exactly the same time and in the same volume of water as the NTU reading, the ERBS enables accurate Suspended Particulate Matter (SPM) in mg/l/ NTU calibration charts to be plotted for up to 3 depths on each deployment. The depth sensor has an accurancy of +/-1% and it is capable of operating at depths of up to 50 m.

ODOM Echo Sounders Sold to USACE

International Industries delivered several ODOM Echotrac CV Echo Sounder systems to the U.S. Army Corps of Engineers (USACE) in Norfolk, Va., and to NOAAs' Office of Coast Survey. USACE Norfolk procured a CV2 (dual Frequency) for use on their Survey Vessel ADAMS II. The Echotrac CV is a new hydrographic echo sounder design incorporating the technology and features of the Echotrac MKIII, plus the ease and flexibility of operation of a networked Windows interface. The transceiver unit is supplied in a compact rack mount package.

The Echotrac CV offers "Charts" in two formats, a full size color LCD "electronic chart" or a high-resolution thermal paper recorder. Both are supplied in flexible modular enclosures complete with swivel mounting hardware. The third option, that of operating the unit and collecting data on a networked PC, is also possible. The color LCD module offers internal data storage (in .XTF format) and playback of the analog return signal digitized to full 16-bit resolution. In addition, the CV offers the possibility of adding a third acoustic channel (X3) to the standard dual frequency

(X2) configuration. Operator selectable TVG curves (10 Log, 20 Log, 30 Log, 40 Log, and Off) serve to optimize the MKIII for both shallow and deepwater bottom detection tasks and for sonar imaging. The Echotrac CV features unsurpassed interfacing flexibility, offering 4 serial ports plus a high speed Ethernet LAN for maximum data collection efficiency. Serial interfaces for motion compensators and DGPS receivers are standard in the CV as are a number of output formats compatible with most common Echo Sounder strings.

Company Profile: Hydracon

Hydracon is an engineering and manufacturing organization with more than 40 years of ocean and aerospace experiences, specializing in subsea products. Hydracon was incorporated 1977 in Houston, Texas, and again in 1990 in Anaheim, Calif.

Prior to Hydracon, founder Alex Pullos had a long history of innovative engineering achievements in the subsea, aerospace, and offshore oil industries. His early experiences were with aerospace hydraulics firms Parker Hannifin Aerospace, Bertea Corp., and Futurecraft Corp. During the mid-60's, with North American Rockwell (now Boeing), he had designed and built several underwater research vehicles, and obtained several patents.

During the early-1970's he designed and built Hydril's first subsea drilling control pod and shear-seal solenoid valve and other related products. With HydroTech International, he was responsible for controls for the "Deep Water Pipeline Repair" program. Hydracon (Texas) was the sales representative for Giannini, Brantner, Benthos, General Oceanics, and others. In 1990 Hydracon (California) began engineering and manufacturing its own designs of submersible electric switches, solenoid valves, solenoid actuators, and a few other subsea products. By the end of 2002 Hydracon's products had grown to more than 50 models, including NAVSEA qualified models.

For more information e-mail
alex@hydracon.com

Fugro Wins Metocean Contract in India

Reliance Industries Limited (RIL) has awarded a metocean contract for "Real-time current monitoring services and metocean data measurements" to Fugro Survey (India) Private Limited (FSIPL) in Mumbai, in collaboration with Fugro GEOS. This contract covers meteorological and current profile measurements from rigs operating on the east and west coasts of India. The data will be used in real-time for operational purposes and analyzed for design criteria. RIL is the largest private operator in India having drilling block acreage in water depths from 600 to 3,000 m.

The initial two-year contract involves providing real-time meteorological and current profile measurements from one rig in water depths of 3,000 m and the two others each operating at around the 600 m mark. The contract began in October 2006 with the 3,000 m depth measurements off the Deepwater Frontier drill ship. The contract provides some interesting challenges, in particular the number of measurements required from one deepwater rig.

During the first phase of measurements at 3,000 m depths, the rig will be fitted with a meteorological station for measurement of atmospheric parameters in real-time and a custom-made gantry, for ADCP (Acoustic Doppler Current Profiler) deployment and support. A downward-looking 38kHz ADCP will profile the first 1,000 m, while an upward facing seabed-mounted ADCP will profile the lower 500 m.

A horizontal ADCP will provide far field near-surface water currents and directional waves unaffected by the rig while an ROV mounted ADCP will provide current profiles in real-time over the full ocean depth down to 3,000 m. Data from all instruments will be displayed and stored on computers on the drill ship running Fugro GEOS software. The second phase of measurements at 600 m depths will include downward-looking ADCPs with horizontal ADCPs measuring currents and waves, with meteorological stations aboard the rigs. The initial contract will involve carrying out observations for two years on three rigs; with the possibility of a contract extension of up to three more years on four additional rigs.

Furuno Wins $5.5m USCG Contract

Furuno USA, Inc. won a multi-year U.S. Coast Guard (USCG) contract valued at just over $5.5 million to supply the Furuno Standard Navigation Acquisition Package (SNAP). The equipment is slated for the replacement of the aging radar systems on Coast Guard patrol and rescue boats.

Obituary: John H. Ryther

By Shelley Dawicki

The Woods Hole Oceanographic Institution announced the death July 9, 2006 of Scientist Emeritus John H. Ryther of Hatchville at Falmouth Hospital after a long illness. He was 83. Ryther was born July 17, 1922 in Newton, Mass., and graduated from Newton High School. He received his A.B. degree in 1947, M.A. degree in 1950 and Ph.D. degree in 1951 from Harvard University, where he was a student of George Clarke. From 1942 to 1945 he served in the U.S. Army air force as a pilot, flying 83 combat missions in Europe, and was discharged in 1945 with the rank of captain.

During the summer of 1950 Ryther spent the month of August at the Institution working in George Clarke's lab in Bigelow. Although his doctoral thesis was on plankton physiology, his interest and experience at that time were in fish ecology. In the winter of 1949-1950 he worked with Jerry Collins stocking the Mashpee River with hatchery raised trout to force the native trout out to sea. The following April he wrote to Alfred Redfield to apply for a summer fellowship, which he was granted, and he began working with Dr. Belding although he also pursued studies of the physiology of unicellular algae isolated from Great South Bay and the effects of salinity on algal growth.

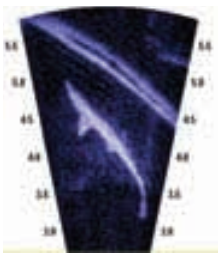
He joined the WHOI staff full time as a research associate in marine biology in October 1951, working with Buck Ketchum and others. In 1956 he was appointed a marine biologist, and in 1961 he was asked to assume overall responsibility for planning the

biological program of the International Indian Ocean Expedition. He and other members of the Biology Department and more than 150 scientists from the U.S. and abroad participated in this major international program, which utilized the converted presidential yacht Williamsburg, recommissioned Anton Brunn, to collect data on particle and dissolved organic carbon in the Indian Ocean and Arabian Sea.

In 1963, Ryther was appointed a Senior Scientist, and with the organization of the Institution into scientific departments he became the first chairman of the Biology Department, serving from 1963 until 1970.

Through his interest in aquaculture, he secured funds in 1972 to build the Environmental Systems Laboratory (ESL) on the Quissett Campus. In the algae ponds and heated/chilled raceways he and ESL staff raised shellfish, fish and seaweed in a controlled environment. He was well known for his experiments incorporating advanced human waste treatment to grow algae as a source of food for shellfish. He also conducted similar experiments at the Harbor Branch Oceanographic Institution in Ft. Pierce, Fla. In 1980, Ryther was named director of the Coastal Research Center. He left WHOI the following year to become a professor of forest resources and conservation at the University of Florida in Gainesville, where he helped develop a marine resources program, and later moved to Harbor Branch Oceanographic Institution. He returned to the Institution in 1987 and was named a scientist emeritus at WHOI in 1988. He wrote one of his last publications for Trout Unlimited on anadromous trout in salt water, visiting trout streams from Long Island to the Canadian Maritimes. During his career he published more than 120 scientific publications, and co-authored one of the first comprehensive books on shellfish aquaculture. Through the years Ryther served as a consultant to numerous government and state agencies, utility companies and state water projects, including the National Science Foundation, National Institutes of Health, Bureau of Sport Fisheries and Wildlife, New York State Department of Education, National Council on Marine Resources and Engineering Development in Aquaculture, Boston Edison Company, and Maine Yankee Atomic Power Company. He was a member of the corporations for many years at the Marine Biological Laboratory and the Bermuda Biological Station.

DIDSON-DH



DIDSON-DH is a Dual-Frequency Identification Sonar with a handle on the back and an external battery that can be mounted on the sonar. The DIDSON-DH is designed to allow divers to "see" in zero visibility environments. The sonar was developed for NSWC-PC to conduct ship hull inspections. The Coast Guard had input on the initial design and requested that the DIDSON-DH be "convertible" meaning that it could also be operated remotely as a standard DIDSON. The sonar connects to the mask-mounted display that has SVGA color resolution. A diver can swim the sonar autonomously or have the sonar connected to the topside via the cable assembly in order for topside personnel to view data simultaneously.

The diver controls are easy. The four control switches (momentary push switches activated with the thumb) are labeled F1, F2, F3, and F4.

For more information e-mail info@oceanmarineinc.com

Submersible Diesel Generator

Sound Ocean Systems, Inc. (SOSI) completed the last of nine submersible diesel generator modules to Input-Output DigiCOURSE (I/O) in support of its new generation buoy based VSO 3-D seismic survey system. Having initially built a prototype last year, SOSI developed a "Beta" pre-production unit earlier this year followed by the first eight production units just completed. I/O has awarded SOSI a follow-on contract for the next production run of 10 additional generator units due to be delivered at the end of January.

SOSI's diesel generators are housed in water-tight enclosures that are attached to the underside of I/O's VSO data buoys. The submersible generator units are supplied by SOSI complete with hull, ballast, batteries, fuel tank, diesel engine, alternator, cooling system, ventilation system, controller, and software. Because the module is completely underwater during operation, each unit is also supplied with snorkels for combustion air and ventilation.

For more information e-mail inquiries@soundocean.com.

Centaur Range of Bathymetric Systems

Sonavision launched the Centaur range of Bathymetric Systems. Sonavision said that the annual calibration procedure can now be run by the customer without having to send the unit back to the manufacturer. The Centaur is based on the UK94 Bathymetric system, and incorporates a digiquartz pressure sensor and a high resolution altimeter. It uses up-to-date electronics and features auto-sensing RS232 / RS485 electronics. The altimeter, which is also available as a standalone product, called Echo, uses 16bit electronics, providing millimeter scale resolution.

For more information e-mail info@sonavision.co.uk

Super SeaArc 5500 Remote Ballast Option

DeepSea Power & Light introduced the latest version of its 150 Watt HID Super SeaArc 5500. DeepSea has designed a remote ballast version of the Super SeaArc 5500 to accommodate challenging mountings.

The Super SeaArc 5500's remote ballast option allows the ballast portion of the light to be mounted up to 15 ft. away from the lighthead.

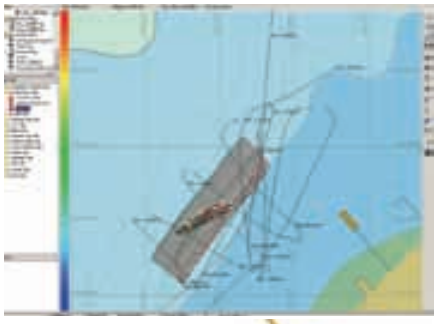
This is key for applications that cannot accommodate the length of the integrated ballast version, but need the impressive light output it offers.

Two color temperature lamp options are available, 4000°K or 7000°K, both of which produce a very white light that penetrates seawater further than conventional incandescent lamps. The 60 degree beam angle (90 degree also available) makes it a good choice for underwater filming or photography, where tight beam control is required.

The Super SeaArc remote ballast version is available in Aluminum or Titanium, for depths of 4,000 m or 6,000 m, respectively.

For more information e-mail sales@deepsea.com

Imagenex Sonars



Users of Imagenex Technology Corp.'s Delta T multibeam sonar and YellowFin sidescan sonar equipment can now benefit from the demonstrated capabilities of HYPACK's hydrographic surveying software. The compact and cost-effective Imagenex Delta T sonar is used for various applications such as obstacle avoidance, navigation and bottom mapping. The profiling version features real-time plotting of raw 3D bathymetry.

For more information e-mail imagenex@npsnet.com

Triton Imaging's V7.1 Software Suite

Triton Imaging, Inc. released Version 7.1 of the Triton Software Suite. New features span the entire Triton product line for sidescan, multibeam, and seismic sonars. New sidescan features include the logging of weight value from Edgetech and other sonars for increased dynamic range in displays, mosaics, and target images. The image is from the Kongsberg HISAS prototype sonar mounted on a HUGIN AUV, with SAS processing by FFI FOCUS, illustrates the clarity of imagery resulting from this new Triton feature. New multibeam features include the introduction of support for the Reson 7125 with dual-head capability and snippet logging.

For more information e-mail sales@tritonimaginginc.com

Sea Catch Off-Load Hook

McMillan Design, Inc. introduced the Sea Catch Off-Load Hook OLH25 designed to safely lower a load to the seabed and automatically release the load upon reaching the seabed. The flexibility of using common shackles as a counterweight, generous capacity, and a lighter unit weight are a few of many features that make this off-load hook unique.

The Sea Catch OLH25 weighs 14 lbs. and has a SWL (capacity) of 5 tons and a pivoting hook sized to receive up to three-in. diameter load line or strap. The entire hook assembly is made of aerospace-grade, heat-treated stainless steel plate. Aligned holes are provided to lock both parts with a hitch pin in order to prevent premature opening of the hook. The counterweight hole is sized to receive up to size 1.5-in. shackle or any heavy object whose weight exceeds a combined counterweight of 36.8 lbs. The OLH25 is secured to a size 0.875-in. lifting shackle and the load is lowered over the side into the water. Once the load is safely in the water, the hitch pin is removed and the load is slowly lowered to the seabed. Once the weight is transferred from the hook to the seabed, the counterweight hook rotates on the pivot pin, thereby releasing the load line. The hook is then lifted to the surface where it is recovered.

For more information e-mail jmcmillan@seacatch.com

Gimbaled Bottom Tripod

Mooring Systems' Gimbaled Bottom Tripod is a unitized structure designed to handle, protect and deploy cylindrical instrument cases. Although adaptable to a wide range of instruments, the Bottom Tripod is built to specifically contain smaller acoustic profilers. The instrument is gimbaled up to 20 degrees and the three legs and spreader bars allow the attachment of a wide variety of equipment such as wave and tide gauges, CTDs and extra battery packages.

For more information e-mail sales@mooringsystems.com

For information on posting a job on these pages and on the "JOBS" site at www.seadiscovery.com, contact Rob Howard at tel: 561-732-4368; fax: 561-732-6984; or e-mail: howard@marinelink.com

HYDROGRAPHER

Job Location: USA, AK Palmer
TerraSond Ltd. has immediate openings for both experienced and entry level hydrographers and data analysts/processors. These positions provide opportunities for surveyors, scientists and engineers who either have experience in or are interested in careers involving mapping the seafloor and its structure. Seasonal, entry level positions which may be suitable for students of these disciplines may also be available.
Responsibilities include setup and operation of state-of-the-art navigation, positioning, sounding, data collection and processing equipment. Equipment includes side-scan sonar, single and multibeam sonar and sub-bottom profiling systems. Previous experience with equipment manufactured by Reson, Edgetech, Odom, CodaOctopus, Kongsberg-Simrad, QPS, Hypack, Caris, Trimble, AUTOCAD and/or MICROSTATION is a plus. Ideal candidates would have a Bachelor's or Master's degree in Geomatics, the physical sciences, Electronics or Information Technology and/or applicable experience in a related field.
Duties include project setup, fieldwork, data processing, analysis of survey results, report preparation, client liaison and all other activities associated with TerraSond's survey, scientific and engineering support services.
Qualified personnel can expect competitive pay and benefits including group health insurance, group life, LTD, and ESOP, 401(k), vacation benefits and holiday pay.
TerraSond Ltd. is an industry leader with offices in Palmer, Alaska and Houston, Texas with projects located worldwide. Interested parties, please forward your resume to jobs@terrasond.com, or visit our website at www.terrasond.com.

Tracy Hazen
Terra Sond LTD
1617 S. Industrial Way Suite 3
Palmer, AK 99645 USA
Phone: 907-745-7215
Fax: 907-745-7273
Email: jobs@terrasond.com
WEB: http://www.terrasond.com

HYDROGRAPHER

Job Location: USA, TX Houston
TerraSond Ltd. has immediate openings for both experienced and entry level hydrographers and data analysts/processors. These positions provide opportunities for surveyors, scientists and engineers who either have experience in or are interested in careers involving mapping the seafloor and its structure. Seasonal, entry level positions which may be suitable for students of these disciplines may also be available.
Responsibilities include setup and operation of state-of-the-art navigation, positioning, sounding, data collection and processing equipment. Equipment includes side-scan sonar, single and multibeam sonar and sub-bottom profiling systems. Previous experience with equipment manufactured by Reson, Edgetech, Odom, CodaOctopus, Kongsberg-Simrad, QPS, Hypack, Caris, Trimble, AUTOCAD and/or MICROSTATION is a plus. Ideal candidates would have a Bachelor's or Master's degree in Geomatics, the physical sciences, Electronics or Information Technology and/or applicable experience in a related field.
Duties include project setup, fieldwork, data processing, analysis of survey results, report preparation, client liaison and all other activities associated with TerraSond's survey, scientific and engineering support services.
Qualified personnel can expect competitive pay and benefits including group health insurance, group life, LTD, and ESOP, 401(k), vacation benefits and holiday pay.
TerraSond Ltd. is an industry leader with offices in Palmer, Alaska and Houston, Texas with projects located worldwide. Interested parties, please forward your resume to jobs@terrasond.com, or visit our website at www.terrasond.com.

Tracy Hazen
Terra Sond LTD
4125 Hollister Road Ste C
Houston, TX 77080
Phone: 907-745-7215
Fax: 907-745-7273
Email: jobs@terrasond.com
WEB: http://www.terrasond.com

SEVERAL OPEN POSITION OF THE MARINE INDUSTRY

Job Location: Singapore, Singapore/Vietnam
Currently we are sourcing for our client in the Drillship Marine environment for their open position.
Open positions like:
Station in Vietnam
1.Adminstration & Cost Controller
2 Contract & Logistic Engineer
Based in Singapore
1 Drilling Equipment Engineer
2 E&I Engineer - 6 month contract
3 Procurement Leader
Please kindly proceed to our website http://www.energyskills.com.sg to apply

Huey Meei
Energyskills
111 Somerset Road #13-03 Singapore Power Building
Singapore 238164
Email: hueymeei.chan@energyskills.com.sg
WEB: http://www.energyskills.com.sg

ENGINEER

Job Location: USA, VA Alexandria

An immediate opening is available for an engineer with commercial or Navy diving background and experience. PCCI's engineering group supports US Navy and commercial clients in diving and hyperbaric system design, waterfront construction, ship salvage, underwater ship repair, and pollution control.
The following are desired capabilities for applicants:
Registered P.E., or E.I.T with ability to obtain P.E.
Basic knowledge of diving systems and recompression chambers
Must be capable of presenting designs in clear and concise engineering formats (AutoCAD, MathCAD, hand calculations, etc)
Ability to travel and work for short periods at job sites is required
U.S. citizenship is required
Please submit fax your resume to:
(703) 684-5343
or Apply Online at www.pccii.com

Tom Hudon
PCCI, Inc.
300 North Lee Street, Suite 201
Alexandria, VA 22314
Phone: 1-703-684-2060
Fax: 1-704-684-5343
Email: thudon@pccii.com
WEB: http://www.pccii.com

SALES REPRESENTATIVE

Job Location: USA, TX Houston
Geonave Marine Systems is seeking a self-motivated individual who can successfully sell an exciting range of survey, positioning and data logging products to customers in the marine and offshore oil and gas industries. The position is based in Houston, Texas and the position is immediately open to the successful candidate.
The ideal candidate will have at least three years expericnce in one of the target industries. Prior sales experience is preferable but not essential for candidates who can demonstrate self-motivation, enthusiasm and the ability to create new sales opportunities. Although training on the company's products will be provided, candidates must be familiar with electronic survey, positioning or data logging equipment.
Travel throughout the US Gulf coast is essential and candidates must possess a valid driving license. Occasional travel outside the Gulf coast region and international travel may also be required. Salary will be commensurate with the position and the company offers comprehensive medical benefits, 401 (k) retirement plan and an employee profit-sharing program.
For further information, please visit our Web site at http://www.geonav.com or send your resume to info@geonav.com.
Andy Bogle
Geonav Marine Systems
Email: info@geonav.com

ROV PILOT

Job Location: Singapore
Offshore Worldwide Drill Rig Locations. Work is based offshore and therefore candidates will be required to work at various offshore locations worldwide as dictated by operational and client requirements.
Responsibilities:
- The ROV Pilot Technician has the primary responsibility for the piloting of the ROV, maintenance and repair of the ROV system, implementation and monitoring of technical procedures and reporting, work management and execution of ROV operational tasks.
- Must be knowledgeable and experienced with the ROV control, navigational and propulsion systems.
- Assist in the Launch and Recovery of the ROV System
- Ensuring that the ROV and all its systems are in complete working order and in compliance with all technical requirements throughout the contract period
- Carrying out the dive in accordance with recognized operating procedures in order to carry out designated work safely and efficiently.
- Undertake navigation and observers duties and operating of manipulators and ancillary equipment fitted to the ROV.
- To be satisfied that prior to any dive the submersible that all pre dive checks have been completed.
- Check with the submersible engineer on the status of the vehicle buoyancy, special fits or any limitations to the system.
- Carry out the dive in accordance with client's work scope and Subsea7 operational procedures to client and operations controller's satisfaction.
- Understands the sub-surface environment that the ROV operates in and any contingency procedures in place for the ROV.

Requirements:
- Minimum of 1 year's relevant previous experience, at operations and in the capacity of ROV Pilot Technician.

Resourcing Manager
EnergySkills
Email: energy.jobs@energyskills.com.sg
WEB: http://www.energyskills.com.sg

DIVING SUPERVISOR

Job Location: Singapore, Singapore
Responsibilities:
- Works below the surface of water, using surface supplied commercial diving or saturation diving to inspect, repair, remove, or install equipment and structures.
- Will use a variety of power and hand tools, such as drills, sledgehammers, torches, and welding equipment.
- May be required to perform NDT, rig explosives, or photograph structures or marine life.
- Will perform rigging both topside and underwater to complete construction projects.

Requirements:
- Minimum 2 years diving experience.

- Must have thorough knowledge of diving practice and theory and knowledge of equipment uses, repair and maintenance.
- NDT certification and u/w welding experience.

EnergySkills
Resourcing Manager, Singapore
Email: energy.jobs@energyskills.com.sg
WEB: http://www.energyskills.com.sg

SENIOR DIVE TECHNICIAN

Job Location: Singapore
Responsibilities:
- Works below the surface of water, using surface supplied commercial diving or saturation diving to inspect, repair, remove, or install equipment and structures.
- Will use a variety of power and hand tools, such as drills, sledgehammers, torches, and welding equipment.
- May be required to perform NDT, rig explosives, or photograph structures or marine life.
- Will perform rigging both topside and underwater to complete construction projects.

Requirements:
- Minimum 2 years diving experience.
- Must have thorough knowledge of diving practice and theory and knowledge of equipment uses, repair and maintenance.
- NDT certification and u/w welding experience.

Resourcing Manager
EnergySkills, Singapore
Email: energy.jobs@energyskills.com.sg
WEB: http://www.energyskills.com.gs

ROV PILOT

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Responsibilities: The ROV Pilot Technician has the primary responsibility for the piloting of the ROV, maintenance and repair of the ROV system, implementation and monitoring of technical procedures and reporting, work management and execution of ROV operational tasks.
Must be knowledgeable and experienced with the ROV control, navigational and propulsion systems. Assist in the Launch and Recovery of the ROV System
Ensuring that the ROV and all its systems are in complete working order and in compliance with all technical requirements throughout the contract period
Carrying out the dive in accordance with recognized operating procedures in order to carry out designated work safely and efficiently.
Undertake navigation and observers duties and operating of manipulators and ancillary equipment fitted to the ROV.
To be satisfied that prior to any dive the submersible that all pre dive checks have been completed.
Check with the submersible engineer on the status of the vehicle buoyancy, special fits or any limitations to the system.
Carry out the dive in accordance with client's work scope and operational procedures to client and operations controller's satisfaction.
Understands the sub-surface environment that the ROV operates in and any contingency procedures in place for the ROV.
Catherine Ting
Energy skills
111 Somerset Rd
Email: catherine.ting@energyskills.com.sg
WEB: http://www.energyskills.com.sg

DRILLERS & ASSISTANT DRILLERS - DRILL SHIP DG-NW95

Job Location: Singapore
Drillers & Assistant Drillers required for an International Oil & Gas exploration company, ideally with 2+ years proven experience in offshore drilling operations. Based from Singapore these are permanent positions working 28 day rotations on a self propelled drill ship. The work is throughout South East Asia and Far East regions. The ships are mobilising very soon so please apply now if you have the right skills and experience.

David Green
TEK Personnel Consultants Ltd
4th Floor, Broadstone House,Broadstone Road,Stockport
Manchester, SK5 7DL United Kingdom
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Email: davidgreen@tekpersonnel.co.uk
WEB: http://www.tekpersonnel.co.uk/

TOOL PUSHER & TOUR PUSHER - DRILL SHIP DG-NW89

Job Location: Singapore
Experienced Tool Pusher & Tour Pusher required for an International Oil & Gas exploration company. Based from Singapore these are permanent positions and the work is throughout the Asia Pacific and Far east regions. To be considered you must have relevant current offshore survival and medical certification and experience in offshore drilling operations.
David Green
TEK Personnel Consultants Ltd
4th Floor, Broadstone House, Broadstone Road, Stockport
Manchester, SK5 7DL
United Kingdom
Phone: +44(0)161 975 0321
Email: davidgreen@tekpersonnel.co.uk
WEB: http://www.tekpersonnel.co.uk/

DRILLING ENGINEER DG-NW199

Job Location: Singapore
With at least 2 years experience of drilling rig operations planning & well cost estimates, drilling budgets & AFE's, together current

MTR MARKETPLACE • PRODUCT & PROFESSIONAL SERVICES DIRECTORY

IWCF well control certification you will be expected to carry out the following: -
Designing of a well and preparation of Drilling Program.
Implement best available economical technology in drilling.
Assisting in Surveillance and improvement of daily progress relating to the wells in hand.
Prepare Well Completion Reports & overall well analysis comparing to the other wells.
Technical bids preparation and evaluation.
Material / equipment selection and evaluations.
Assisting in preparation of services contracts and monitoring contractor's performance.
Shore base Planning & Management.
Participate in special technical studies, teams and task forces as required toward meeting departmental objectives.
The position is with an International offshore Drilling Company based in Singapore and they will provide an excellent Salary and Accommodation package.

David Green
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4th Floor, Broadstone House,Broadstone Road,Stockport
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Phone: +44 (0) 161 975 0321
Email: davidgreen@tekpersonnel.co.uk
WEB: http://www.tekpersonnel.co.uk/

MARINE SAFETY SPECIALIST

Job Location: Indonesia, JAKARTA
The marine Safety Specialist shall perform a marine inspection of barges, LCT, Cargo ships, accommodation, etc. to determine vessel fitness to perform its activities. A specific requirement of the vessels are, at the time of inspection Classed with SOLAS, IMO and BKI requirements. The inspection must focus on all the normal aspects of vessel marine inspection, including, but not limited to:
Safety equipment and navigational equipment are adequate and functional. He shall report on condition and functionality and any unsafe acts / practices that might be observed.
To meet the minimum requirement of this position, the Marine Safety Specialist shall possess at least a high school diploma (or equivalent) and he shall have at least ten (10) years working experience inspecting barges, LCT, Cargo Ships, accommodations, etc. The Marine Safety Specialist must have a complete understanding of SOLAS & IMO requirements as well as the safety regulations, policies and procedures of the Indonesian government, EPC contractor and COMPANY. The Safety Officer must have excellent interpersonal skills as well as good written and oral communication abilities. International construction experience, especially within Indonesia is highly desirable.
N.Chandrasekaran
PT.ISTECH RESOURCES ASIA
Phone: 62-21-5274206
Fax: 62-21-5274214
Email: chandra61@istech.co.id

LST/DIVERS

Job Location:
United Arab Emirates, Abu Dhabi
Urgently required for our client in the field of Oil & Gas: Life Support Technician, Divers, Chief Mate, Captain
Excellent Package will be offered for the right Candidates
send your resume to the info@middleeastoilandgas.com
Omar Sibai
Middle East Oil & Gas
Abu Dhabi, UAE United Arab Emirates
Email: info@middleeastoilandgas.com
WEB: http://www.middleeastoilandgas.com

MARINE INSTRUCTORS

Job Location: USA, FL Orlando
You have so much to offer the next generation. You've gone far in your career. You've accumulated knowledge and experience about some of the biggest names in marine manufacturing. And now you can experience the rewards that come from sharing that experience at Marine Mechanics Institute (MMI), a division of Universal Technical Institute. A national provider of marine mechanic education training, we've teamed with Volvo-Penta, Honda, Yamaha and other industry leaders to supply students with the kind of training that opens doors. And supply you with a more rewarding future.
We are currently seeking Marine Instructors to enjoy the endless summers of Orlando, Florida while instructing students in marine technology.
Requirements:
*High School Diploma or GED
*Five or more years of related technical experience
*Computer proficiency
We provide excellent training that leads the way in applying your technical expertise in the classroom. Start guiding tomorrow's leaders today at MMI and enjoy a great compensation package.
For consideration, please Apply Online at:
https://www.ultirecruit.com/uni1025/JobBoard/JobDetails.aspx?__ID=*B6EE291055DAD3A33
Please reference job requisition # D13
UTI is an Equal Opportunity Employer and supports diversity in the workplace. Drug testing is required.
www.uticorp.com
Human Resources
MMI, a division of Universal Technical Institute apply online
Orlando, FL 32801
WEB:
http://https://www.ultirecruit.com/uni1025/JobBoard/JobDetails.aspx?__ID=*B6EE291055DAD3A33

SIMULATOR OPERATOR (PART-TIME)

Job Location: USA, CA Vallejo
PART-TIME SIMULATOR OPERATOR

DEPARTMENT OF SIMULATION
CALIFORNIA MARITIME ACADEMY
A CAMPUS OF THE CALIFORNIA STATE UNIVERSITY
Please submit application materials for immediate consideration. Position will remain open until filled.
The Department of Simulation of the California Maritime Academy invites applicants for a part-time, temporary, Simulator Operator (Special Consultant).
GENERAL DESCRIPTION: The California Maritime Academy, a specialized campus of the California State University (CSU), offers undergraduate degrees in Mechanical Engineering, Marine Engineering Technology (ABET/TAC accredited), Facilities Engineering Technology, Marine Transportation and Business Administration. The campus is located in Vallejo, 30 miles northeast of San Francisco. See our web page for more information: http://www.csum.edu

RESPONSIBILITIES/DUTIES: This position is responsible for operating a simulator console; loading and running simulator scenarios; assisting in generating scenarios; role playing during simulation (radio, telephone); and assisting in maintaining chart/publications inventory.

MINIMUM QUALIFICATIONS: Knowledge of marine industry, marine communication experience, and computer literate. Must have underway experience as a bridge watch stander.

DESIRABLE QUALIFICATIONS: USCG Third Mate License

ELIGIBILITY TO WORK: Applicants must provide proof of U.S. citizenship or authorization to work in the United States within three days from the date of hire.

COMPENSATION: Salary is commensurate with the education and experience of the individual.

PHYSICAL AND ENVIRONMENTAL CONDITIONS: Must be able to lift up to 50 pounds, and have manual dexterity to operate two computers at once. Candidate must work in a simulator with loud speakers, and electrical cables and wiring.

APPLICATION INFORMATION: Applicants for the positions should submit the following for immediate consideration:
1. Letter of Interest
2.Resume
3. Names, addresses, and telephone numbers of three professional references.
4. Employment Application
5. USCG License
6. Applicant Flow Information (optional)

APPLICATION PROCESS: An official application and optional Applicant Flow Sheet are available at www.csum.edu and clicking on Jobs or by calling the Jobline at 707-654-1140. Based upon review of resumes and accompanying documents, only persons whose qualifications best match job requirements will be interviewed.

Applicants selected for interview will be notified by mail or telephone. Those persons not selected for an interview will be notified only after the position closes and the successful candidate has been selected.

Send letter of interest with accompanying documents to: HUMAN RESOURCES, JOB BULLETIN #3-06/07
ATTN: T. BENCH, FACULTY HR ANALYST
CALIFORNIA MARITIME ACADEMY
200 MARITIME ACADEMY DRIVE
VALLEJO, CA 94590-8181

DISCLAIMER: The provisions of this bulletin do not constitute an expressed or implied contract and any provisions in this bulletin may be modified or changed.

The California Maritime Academy is committed to a diverse workforce and equal opportunity employment

T. Bench
California Maritime Academy
200 Maritime Academy Drive
Vallejo, CA 94590 USA
Phone: (707) 654-1136
Fax: (707) 654-1141
Email: tbench@csum.edu
WEB: http://www.csum.edu

FACULTY (TEMPORARY), LIFEBOAT-MAN/SM.VESSEL COURSES

Job Location: USA, CA Vallejo
FACULTY POSITION AVAILABLE
TEMPORARY, FULL-TIME OR PART-TIME

APPROXIMATE STARTING DATE: JANUARY 2, 2007

DEPARTMENT OF MARINE PROGRAMS/OPERATIONS CALIFORNIA MARITIME ACADEMY
A CAMPUS OF THE CALIFORNIA STATE UNIVERSITY

FOR FULL CONSIDERATION, APPLICATION AND DOCUMENTS SHOULD BE RECEIVED BY NOVEMBER 22, 2006. HOWEVER, POSITION WILL REMAIN OPEN UNTIL FILLED.

The Department of Marine Programs/Operations of the California Maritime Academy invites applications to fill one full-time, or two part-time, non-tenure track faculty position. The Department of Marine Programs provides instructional support to other degree programs on campus.

RESPONSIBILITIES: The responsibilities of this position include but are not limited to:
- Teach courses related to USCG Lifeboatman certification
- Teach courses in small craft operations
- Teach other basic courses, as needed
- Teach basic STCW courses, as needed
- Opportunity to take part in one of two 60 day summer training cruises aboard Training Ship Golden Bear

MINIMUM QUALIFICATIONS:
- USCG certified Lifeboatman
- Significant experience (five years) in vessel operations
- USCG License
- STCW compliant
- Excellent communication and leadership skills

DESIRABLE QUALIFICATIONS:
- Teaching experience
- Small Vessel experience

SALARY COMPENSATION: Salary is commensurate with the education and experience of the individual. The current full-time, one-year Maritime Vocational Lecturer, Non-Cruise salary range within the California State University System starts at $37,620.

All mariners should be capable of living and working in cramped spaces on rolling vessels, maintaining balance on a moving deck, rapidly donning an exposure suit, stepping over doorsills of 24 inches in height, opening and closing watertight doors that may weigh up to 56 pounds, pulling heavy objects, up to 50 lbs. in weight, distances of up to 400 feet, climbing steep stairs or vertical ladders without assistance, participating in firefighting and lifesaving efforts, including wearing a self-contained breathing apparatus (SCBA), and lifting/controlling fully charged fire hoses. Extended workdays are common.
BENEFITS: The California Maritime Academy offers a broad range of benefits for qualifying positions including medical, dental, vision, retirement, life and disability insurances, fee-waiver, vacation and sick leave.

APPLICATION INFORMATION: Applicants for the position must submit the following documents:
1. Employment Application
2. Applicant Flow Information (optional)
3. Letter of interest
4. Resume
5. Names, addresses, and telephone numbers of at least three professional references

APPLICATION PROCESS: All applicants selected for interview will be notified by mail or telephone of the interview schedule. Those persons not selected for interview will be notified only after the position closes and the successful candidate has been selected. Additional information may be obtained by calling the Academy's job line (707) 654-

1140 or visiting www.csum.edu.

Send application documents with appropriate address, phone number, and fax number to:

HUMAN RESOURCES, JOB BULLETIN #14-06/07
T. BENCH, FACULTY HUMAN RESOURCES ANALYST
CALIFORNIA MARITIME ACADEMY
200 MARITIME ACADEMY DRIVE
VALLEJO, CA 94590-8181

DISCLAIMER: The provisions of this bulletin do not constitute an expressed or implied contract and any provisions contained in this bulletin may be modified or changed.

The California Maritime Academy is committed to a diverse work force and equal opportunity employment

T. Bench
California Maritime Academy
200 Maritime Academy Drive
Vallejo, CA 94590 USA
Phone: (707) 654-1136
Fax: (707) 654-1141
Email: tbench@csum.edu
WEB: http://www.csum.edu

FIELD INSTALLATION ENGINEER

Job Location: USA, VA Norfolk
Growing automation & systems integration company is seeking an experienced field engineer for Navy ship installations. The successful candidate will: Participate as a member of a team or work alone during the installation & start-up of instrumentation and control equipment aboard Navy ships. Work closely with ship alteration contractors by providing oversight & management of installation activities. Provide guidance & training to customer personnel in establishing procedures and techniques. Analyze equipment failures to determine cause & recommend corrective action. Advise & assist in effecting design changes. Participate in the installation planning phase. This position requires an in-depth knowledge of ship electrical, piping & structural modifications for installation of new equipment. Candidate must be familiar with reading & interpreting complex ship installation drawings. Must have a thorough understanding of proper procedures dealing with shipboard installations in a shipyard environment. 4 years of ship installation design and installation management experience desired. 2 positions available, based in Norfolk VA or San Diego, with expected travel of up to 25%.
www.nagllc.com
Wayne Morlatt
Naval Automation Group
2511 Walmer Ave
Norfolk, VA 23513
Phone: 800-830-5186
Fax: 757-852-3998
Email: jobs@nagllc.com
WEB: http://www.nagllc.com

MARINE GEOSCIENTIST

Job Location: USA, WA Seattle
The Marine Geoscientist is responsible for seabed sample collection, data interpretation and/or reporting in regards to company desktop studys and survey projects.
Specific responsibilities include:
- Coordinate technical investigations with senior management and clients.
- Geological and geophysical sample collection, data interpretation and reporting during offshore and onshore operations.
- Prepare desktop studies, project plans, survey procedures and other documents required to support survey activities.
- Conduct site visits to determine the acceptability of a site for a cable landing.
- Select locations, analyze and document seabed samples (cores, dredges, grabs, etc.),
- Ensure conformance to quality criteria, professional standards and contract specifications for all aspects of survey project, both on- and offshore.

Applicants MUST be US Citizens or POSSESS authorization to work in the US, and have an MA/MSc in geology, oceanography, or related field AND five years applicable experience.
Carrie Higley-Krowka
Fugro Seafloor Surveys, Inc.
2727 Alaskan Way - Pier 69
Seattle, WA 98121
Email: hr@seafloor.com
WEB: http://www.seafloor.com

CONTRACTS MANAGER/BUSINESS DEVELOPMENT

Job Location: USA, WA Seattle
The Contracts Manager reviews and responds to all Requests for Quotations (RFQs) and coordinates contract budgeting, proposal preparation, and contract negotiations with FSSI marine survey customers. This requires constant contact with existing and potential clients with the purpose of expanding FSSI's international market share of the marine survey, research and development, and data management industries.
Specific duties include:
- Review and respond to Request for Quotations (RFQs), coordinating all contract budgeting, proposal preparation, and contract negotiations for FSSI.
- Assume daily responsibility for compliance with terms and conditions of all contracts.
- Oversee all US and international business authorizations including import/export procedures and requirements, survey and vessel permitting, customs and clearance of FSSI equipment and personnel.
- Maintain direct and frequent contact with existing and potential international clients.
- Maintain commercial and marketing communications within the Fugro Group of companies and develop FSSI's role in supporting and utilizing the Fugro network.
- Coordinate FSSI's roll in joint Fugro Group business endeavors.
- Provide commercial support to FSSI project managers and survey operations.
- Coordinate banking needs with the FSSI Controller.

- Stay generally informed about the businesses of FSSI to perform administrative, operational and executive functions in the absence of the company President.

Applicants MUST be US Citizens or POSSESS authorization to work in the US; have a minimum of 5 years of extensive international marine survey administrative experience. An MBA is a strong asset. Additional experience should include applicable general business management in the marine surveying environment.
Carrie Higley-Krowka
Fugro Seafloor Surveys, Inc.
2727 Alaskan Way - Pier 69
Seattle, WA 98121
Email: hr@seafloor.com
WEB: http://www.seafloor.com

SEAGOING ELECTRONICS ENGINEER

Job Location: USA, WA Seattle
We are seeking someone with mechanical and electronics aptitude and five or more years experience to operate and maintain a variety of state-of-the-art survey equipment in a physically demanding environment.
This position requires 3 to 4 months per year at sea and includes assisting with vessel mobilization & demobilization, equipment assembly, operation, repair and maintenance of proprietary and third party survey systems. This position also provides technical support on development of state-of-the-art marine survey systems projects, and participation in onshore inspections, maintenance, testing and calibration of equipment.
Applicants MUST be US Citizens or POSSESS a valid visa for work in the US; and have a BSc in Electronic Engineering or the equivalent.
Carrie Higley-Krowka
Fugro Seafloor Surveys, Inc.
2727 Alaskan Way - Pier 69
Seattle, WA 98121
Email: hr@seafloor.com
WEB: http://www.seafloor.com

SUBSEA MANAGER / ENGINEER

Job Location: Singapore
Job Description:
- Candidate will be part of the FPSO Project Management Team for the preparation of subsea facilities operations, covering the flowlines / pipelines, subsea equipment, and FPSO hull / subsea interface.
- Candidate shall provide input to the client's field development design, FATs, construction / pre-commissioning, commissioning and hand-over activities in liaison with the other project team members.

Requirements:
- Ideally be degree qualified in an Engineering disciplineo
- Minimum of 10 years experience in subsea engineering.
- Good understanding of: Subsea Control Systems, Flexible Flowlines, Umbilicals and Subsea Structures (manifolds/wellhead/xmas trees/PLETs)
- Experience in Oil and Gas Industry
- Experience in multi-national working environment is desired
- English speaking and writing
- Competent in the application of IT packages including MS Word, Excel and Powerpoint.

Responsibilities
- Reports to Project Manager.
- Responsible to prepare a safe, technically sound and timely startup of the field subsea facilities.
- Participate in the start-up / performance test phase.
- Provide assistance for subsea production to achieve optimized overall performance (HSE, production, subsea facilities operations) during the startup of the project.
- Responsible for all subsea systems from bid development, contracting, design, fabrication, installation, commissioning through to handover.

Alvin Nadel
EnergySkills
Email: alvin.nadel@energyskills.com.sg
WEB: http://www.energyskills.com.sg

PROJECT ENGINEER

Job Location: USA, FL Daytona Beach
Essential Duties and Responsibilities:
- The main purpose of this position is to manage and perform the engineering design and development of ODI's products.
- Perform project level design and development of ODI products using CAD and conventional engineering techniques.
- Generate supporting documentation for designs, including assembly and test procedures.
- Regularly interface with customers to develop business in new and existing markets.
- Generate, review and approve supporting documentation for designs, including assembly and test procedures.
- Apply project management skills to ensure timely completion of projects
- Provide engineering support to other departments, as required.
- Follow and contribute to the development of ODI procedures, accepted engineering practices, and any relevant design practices in accordance with given requirements.
- Work with project/accounts managers.
- Perform other duties as assigned by Engineering Manager.

Education and Experience
- BSME or related Engineering Degree (Masters Preferred/PE a plus) o 3-6 years experience in mechanical design engineering

Job Knowledge, Skills and Abilities
- Working knowledge of CAD/CAE (AutoCad and SolidWorks preferred) o Experience with electrical systems and fiber optics is desirable o Excellent organizational skills o Excellent verbal & written communication skills o Ability to handle multiple tasks in fast paced environment

Physical Demands
- Ordinary office capabilities

Cheryl Perreault
Ocean Design
1026 N. Williamson Blvd
Daytona Beach, FL 32114
Phone: 3862360780
Fax: 3862360894
Email: cperreault@odi.com
WEB: http://www.odi.com

MATERIALS SUPERVISOR

Job Location: USA, FL Daytona Beach
Essential Duties and Responsibilities:
- Oversee the various planning aspects of the company to assure customer expectations are met.
- Proactively review orders throughout the process to identify, coordinate and communicate the activities required to achieve customer expectations and company objectives.
- Monitor the various areas of receiving, receiving inspection and inventory control to make sure that all procedures are being followed and to revise procedures as required.
- Support on-time performance of all shop orders through prioritizing and managing material flow to the production floor.
- Over-see and prioritize, as needed, all material handling and inventory activities.
- Work closely with planning, production and purchasing to support the production schedule.
- Ensure accurate and appropriate levels of inventory, including consumable supplies.
- Supervisory duties, including scheduling, attendance and performance monitoring.
- Maintain excellent communication and working relationship with all departments within the company.
- Comply with, and assist in the enforcement of all company safety policies.

Education and Experience
- Associates Degree in related field is required. BS/BA is desirable o Must have minimum of 2 years experience in Inventory Management. Production Planning and Procurement experience preferred.
- Supervisory experience required.
- CPIM certification required.

Job Knowledge, Skills and Abilities
- Proven Project management skills

- Well Organized and Multi-tasked, Self Starter
- Proven leadership/Supervisory skills/experience (ability to drive and motivate)
- Computer Literate - proficient in Microsoft Word, Excel, Outlook, ERP systems
- Strong interpersonal communication skills-written & verbal.
- Professional appearance and behavior
- Team player a must.
- Machine/Job shop planning/procurement a plus
- Previous experience in Engineer-to-order company a plus

Physical Demands
- Occasional lifting up to 30 lbs
- Use of computer for extended periods

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COST & PRICING ANALYST

Job Location: USA, FL Daytona Beach
Essential Duties and Responsibilities:
- The individual is responsible for providing quotations to customers by utilizing sales and technical knowledge for the preparation of quotation packages for moderately complex projects.
- Coordinates bid strategy with outside sales representatives and Account Managers / Project Managers.
- Interprets customer requirements and offers solutions that maximize profitability and add value for the customer.
- Matches ODI products and services to customer specifications and drawings by demonstrating thorough knowledge of ODI products and services.
- Reviews customer specifications/drawings to ensure quote is technically compatible and competitive. Coordinates with Sales Engineer to determine and/or clarify project requirements to ensure quality output.
- Understands, analyzes, documents, and communicates contractual, technical and commercial terms and conditions relative to the company standard. Maintains a current understanding of bid strategies and market conditions.
- Follows up on outstanding quotations to secure orders, improve quotation process and measure effectiveness.
- Incorporates use of technological capabilities to improve processes and efficiency.
- Assists outside sales representatives in the preparation of customer presentations related to the quote, including comments on exceptions and built in value.
- Processes change orders as needed.
- May perform Bill of Material preparation for large, complex projects with the guidance of a Senior or Staff Quotation Specialist
- Involved in order handoff process as needed to ensure proper order conversion.

Education and Experience:
- BS in engineering [preferred] or suitable relevant experience. 5 years minimum of industry experience, preferably with a service or manufacturing organization.
- 3 years minimum of quotation /proposal preparation experience for manufactured products [electrical and fiber products is a big plus].

Job Knowledge, Skills and Abilities:
- Ability to deal effectively and tactfully with a wide variety of individuals in person, via telephone and in writing. Ability to work independently and resolve practical problems.
- Computer literate in ODI standard software packages [Microsoft Office, Outlook, Excel, Word, Power Point, IFS, and ACAD].
- Excellent communications and interpersonal skills. o Must be a U.S. Person as defined in the ITAR, 22 CFR 12.15 (US. Citizenship or Resident Alien status) o Knowledge of DOD cost / price practices including EVMS is a plus

Physical Demands: o Able to stand or sit for prolonged periods, and move about the facility o Prolonged periods of time on computer

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HARDWARE/SOFTWARE INSTALLATION MANAGER, DCAMS

Job Location: USA, VA Alexandria
We have an immediate opening for a mid level manager to support management, installation, testing and training of the Damage Control Action Management System (DCAMS) on board US Navy ships. We provide DCAMS hardware and software installations support to the Naval Sea Systems Command (NAVSEA) Damage Control and Fire Protection Branch, NAVSEA 05P4.
Responsibilities
- Assist in preparation of Ship Project Directives to support DCAMS installation funding requirements.
- Coordinate development of DCAMS Technical Data Packages that document the DCAMS installation of hardware and software on each specific ship type.
- Assist in the preparation of PARM Program Reviews to the ship's Program Office.
- Manage and coordinate Alteration Installation Team subcontractors, including development of Statements of Work, reviewing subcontractor bids and development of subcontractor selection criteria.
- Internal Software Installation, Testing and Training staff involvement in the DCAMS installation.
- Coordinate development of Logistics Support materials to support installation and Life Cycle support of DCAMS.▪ Coordinate DCAMS hardware procurement, log in and tracking of hardware in accordance with Government Property Management procedures.
- Maintain close liaison with NAVSEA clients for coordination and management of DCAMS installations.
- Manage DCAMS installation tasking financial and personne▪ equirements to support the installations.

Minimum Essential Education: BS in Engineering and/or Management. In lieu of an undergraduate degree, comparable or specialized experience working with Naval ship installation support would be considered.
Minimum Essential Experience: 5 - 10 years experience in US Navy systems support. Government contracting and program management experience a plus.
Essential Skills/Capabilities: (1) Good understanding of US Navy systems. (2) Good understanding of Computer Software system fundamentals. (3) Excellent writing and communication skills. (4) Proficiency with MS Office Suite. (5) Good organization and people skills. (6) Motivated, self starter. (7) Process oriented with an attention to detail.
Professional Licenses/Certifications: None required.
Security Clearance: Current clearance desirable. Ability to obtain security clearance is mandatory.
Travel Requirements: Occasional travel to shipyards and Naval Sea Systems Command will be required.
Mark Batenchuk
Aerotek Engineering
Alexandria, VA 22301
Phone: 703-818-2026
Email: mbatench@aerotek.com

MARINE ENGINEER / NAVAL ARCHITECT

Job Location: USA, MD Silver Spring
Provide technical support for current and emerging NOAA (National Oceanic and Atmospheric Administration) work under various support contracts. Independently review, assess and resolve technical issues. Perform ship and ship system design reviews, tradeoff studies, engineering analyses, and other technical and programmatic functions as required.
Qualifications:
- B.S. in Marine Engineering or Naval Architecture
- 5-10 years experience in ship and ship system design, design reviews and engineering analyses
- Structural and/or mechanical, electrical or propulsion systems experience
- Familiarization with USCG/ABS regulations
- ABS=American Bureau of Shipping
- USCG=United States Coast Guard
- U.S. Citizen with the ability to obtain SECRET required

Desired experience:
1. Military Sealift Command (MSC)
2. PMP Certificaiton
3. Masters in engineering or MBA

For immediate review and consideration please forward resume to mbatench@aerotek.com or call Mark Batenchuk 703-818-2026
Mark Batenchuk
Aerotek Engineering
Silver Spring, MD 20901
Phone: 703-818-2026
Email: mbatench@aerotek.com

SUBSEA - DRILLSHIP (DRILLER)

Job Location: Vietnam, Vietnam
Position Description:
- Operate a core or percussive drilling rig, up to 12 hours per day.
- To operate drilling and mud circulating equipment in accordance with the well program.
- To operate all equipment at the driller's console in a safe manner and to have good knowledge of well conditions and respond effectively to all well control situations.
- Proven leadership skills required to supervise the assistant driller, derrickhand and drill crew.
- Prepare daily reports of all drilling activities. These reports reflect footages drilled, time spent performing other activities besides drilling, reporting supplies consumed, etc.
- Conduct daily "tool box" safety meetings. This includes preparing reports of such meetings and forwarding them to the local office.

Certification Required:
Valid medical certificate for Offshore Personnel on Mobile Units
- Valid BOP Certificate (Surface and Sub-sea) Supervisory Level
- Well Control / H2S. It must be updated immediately upon expiration.
- Supervisory Skills Training
- Sea Survival & Helicopter Underwater Escape Training (HUET)
- Rig Specific Induction (onboard orientation)
- Other certificates (Fire Fighting, Offshore Survival, etc.) may be required by the Company.

Ms.Christina
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Eunos, 409838 Singapore
Phone: +65-68412537
Email: christina@ultrastar.com.sg
WEB: http://www.sgmarinejobs.com

ROV CONTENT DEVELOPER

Job Location: USA, CA Sacramento / Davis
About Schilling Robotics
Schilling Robotics is a world leader in telerobotics technology for use in extreme environments, and has earned an impeccable reputation for equipment design and customer service. The company is seeking the best and brightest people to enhance an exciting product line of subsea remotely operated equipment, telerobotic manipulators, and associated hardware. At Schilling Robotics, people and machines work together to achieve practical engineering solutions through quality, reliability, and exceptional customer service.
Position: Content Developer/Technical Writer

This position provides content development, writing, and illustrating skills, and technical knowledge and expertise to the technical Publications Department in support of technical manuals.

Responsibilities:
- Conduct formal and informal interviews with Schilling Robotics and customer subject matter experts to develop and verify manual content.
- Independently investigate subjects to develop and verify manual content.
- Create documents and graphics presenting content.
- Perform all tasks to meet schedules and deadlines.

Qualifications
- Technical expertise in one or more of the following: software/controls, hydraulics, electrical, mechanical.▪ Field experience in a marine environment or industry.▪ Experience with Schilling Robotics equipment and/or related products is preferred

Knowledge and Skills Required:
- Ability to develop manual content that is product and customer/user relevant through interview and investigation
- Ability to create new and/or utilize existing graphic materials (drawings, photographs, etc.) to support written content.
- Some experience with MS Word and/or other word-processor or desktop publishing software.

Compensation Package
Schilling Robotics offers a competitive salary/benefit package, including:
- Health, dental, and life insurance
- Flexible spending plan for child care and unreimbursed medical expenses
- Employer 401(k)

Human Resource Department
Schilling Robotics, LLC
201 Cousteau Place
Sacramento / Davis, CA 95616
Phone: 530-753-6718
Email: HR@Schilling.com
WEB: http://www.schilling.com

ROV / ETO SYSTEMS PROGRAM MANAGER

Job Location: USA, CA Sacramento / Davis
Join the Sub-Sea world of Schilling Robotics! Schilling Robotics is the world's leading supplier of telerobotic manipulator systems for remotely operated vehicles (ROVs) and cable trenching machines used in offshore oil, telecommunications, scientific, and military operations. We offer four standard remote manipulator systems. We also produce the QUEST electric and hydraulic work-class ROV systems and the Remote Systems Engine, a set of modular building blocks for underwater propulsion, actuation, control, and communication.
Schilling Robotics is an employee-owned company that emphasizes high personal standards, team focus, accountability, and honesty from its employees.
Program Manager-ROV/ETO Systems
Description
Responsible for complex, multimillion-dollar ETO/ROV system projects. Critical liaison between client, engineering, production, and Schilling Robotics management. Reports to Director of Program Management.

Responsibilities
- Manage complex engineer-to-order (ETO) and remotely operated vehicle (ROV) build programs for clients
- Review equipment specifications with engineering to determine resource requirements to complete project
- Execute contracted requirements for engineering, equipment, and documentation deliverables
- Establish schedule for assigned programs to meet client's requirements
- Act as liaison with manufacturing to ensure proper resourcing for project
- Weekly track all project costs, deadlines and insure that projects remains on schedule and within budget
- Report project status to client and corporate and plant management on weekly basis
- Provide support to other internal departments as required and desired.

Qualification Requirements:
- 8 to 10+ of project management experience
- 4 years project management experience in or ROV Offshore Oil field
- Proficient in use of MS Office, MS Project, and MRP/ERP software
- Experience in managing complex projects for vessel ROV equipment and/or services
- Technical competence
- Strong drive to "create opportunities," "make things happen," and aggressively meet deadlines
- Self-motivated
- Good verbal and written communications skills.

Preferred Qualifications
- Accredited PMP
- Experience in dealing with ROV industry clients

Human Resource Department
Schilling Robotics, LLC
201 Cousteau Palce
Sacramento / Davis, CA 95616
Phone: 530-753-6718
Email: HR@Schilling.com
WEB: http://www.schilling.com

SONAR DATA PROCESSOR / CARTOGRAPHER

Job Location: USA, WA Seattle
Fugro Seafloor Surveys, Inc. (FSSI) is part of the Fugro Group of survey, positioning and geotechnical companies. It is a multidisciplinary marine surveying company, providing expertise in marine geology/geophysics, sonar engineering, software design, swath mapping, data processing, submarine cable engineering, and geophysical research.
FSSI is most widely known for its unique marine survey technology, which uses exclusive vector side-scan sonar technology. This technology allows us to provide our clients with high-resolution, geometrically precise, swath bathymetry maps and clear images of acoustic backscatter from the seafloor. The combination of co-registered seafloor backscatter intensity and bathymetry data are used in remote sensing applications, and are the acoustic equivalent of aerial photographs and topographic maps.
We currently have a need for Marine Geoscientists, Electronics Engineers, Senior CADD/GIS Operators and Sonar Data Processor/Cartographers. Please see www.seafloor.com for position descriptions.
Carrie Higley-Krowka
Fugro Seafloor Surveys, Inc
2727 Alaskan Way
Seattle, WA 98121
Phone: 206-441-9305
Email: hr@seafloor.com
WEB: http://www.seafloor.com

SENIOR CADD/GIS OPERATOR

Job Location: USA, WA Seattle
Fugro Seafloor Surveys, Inc. (FSSI) is part of the Fugro Group of survey, positioning and geotechnical companies. It is a multidisciplinary marine surveying company, providing expertise in marine geology/geophysics, sonar engineering, software design, swath mapping, data processing, submarine cable engineering, and geophysical research.
FSSI is most widely known for its unique marine survey technology, which uses exclusive vector side-scan sonar technology. This technology allows us to provide our clients with high-resolution, geometrically precise, swath bathymetry maps and clear images of acoustic backscatter from the seafloor. The combination of co-registered seafloor backscatter intensity and bathymetry data are used in remote sensing applications, and are the acoustic equivalent of aerial photographs and topographic maps.
We currently have a need for Marine Geoscientists, Electronics Engineers, Senior CADD/GIS Operators and Sonar Data Processor/Cartographers. Please see www.seafloor.com for position descriptions.
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2727 Alaskan Way
Seattle, WA 98121
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Email: hr@seafloor.com
WEB: http://www.seafloor.com

ELECTRONICS ENGINEER

Job Location: USA, WA Seattle
Fugro Seafloor Surveys, Inc. (FSSI) is part of the Fugro Group of survey, positioning and geotechnical companies. It is a multidisciplinary marine surveying company, providing expertise in marine geology/geophysics, sonar engineering, software design, swath mapping, data processing, submarine cable engineering, and geophysical research.
FSSI is most widely known for its unique marine survey technology, which uses exclusive vector side-scan sonar technology. This technology allows us to provide our clients with high-resolution, geometrically precise, swath bathymetry maps and clear images of acoustic backscatter from the seafloor. The combination of co-registered seafloor backscatter intensity and bathymetry data are used in remote sensing applications, and are the acoustic equivalent of aerial photographs and topographic maps.
We currently have a need for Marine Geoscientists, Electronics Engineers, Senior CADD/GIS Operators and Sonar Data Processor/Cartographers. Please see www.seafloor.com for position descriptions.
Carrie Higley-Krowka
Fugro Seafloor Surveys, Inc.
2727 Alaskan Way
Seattle, WA 98121 USA
Phone: 206-441-9305
Email: hr@seafloor.com
WEB: http://www.seafloor.com

MARINE GEOSCIENTIST

Job Location: USA, WA Seattle
Fugro Seafloor Surveys, Inc. (FSSI) is part of the Fugro Group of survey, positioning and geotechnical companies. It is a multidisciplinary marine surveying company, providing expertise in marine geology/geophysics, sonar engineering, software design, swath mapping, data processing, submarine cable engineering, and geophysical research.
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Seattle, WA 98121
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WEB: http://www.seafloor.com

SCIENTISTS

Job Location: USA, WA Seattle
Hydroacoustic Technology, Inc. is seeking scientists to conduct varied fisheries research studies using state-of-the-art acoustic tag tracking and hydroacoustic (sonar) systems. For the right individual, this is an excellent position in an exciting, dynamic company.
Position: Scientist (Project Leader)
Start Date: Nov-Dec 2006
Salary: Very competitive, based on qualifications and experience.
Benefits: Vacation/sick leave/holidays, medical/dental/vision plan, retirement, bonus program.
Location: Seattle, Washington. Must be willing to travel, typically to Eastern Washington, and occasionally to Oregon, East Coast, Canada, Alaska, Europe and other locations as assigned. Most field assignments are for 1-4 wk at a time, typically 1-2 times/year.
Duties: Responsible for conducting acoustic tag and hydroacoustic fisheries studies, including system deployment and testing, data collection and analysis, interpretation of results, report writing, supervision of personnel, other field duties, and interfacing with clients. Supervises personnel responsible for data entry and data analysis via computer. HTI will train in acoustic tag and hydroacoustic techniques.

Minimum Education: Bachelor degree in a scientific field (e.g., fisheries, wildlife,

Requirements: oceanography, computer sciences, engineering, etc.). Masters degree is a plus.
Computers: Experience required with MSWindows, Windows OS, XP, MS Word and

spreadsheet programs (e.g., MS Excel). Data base (e.g., MS Access), data management (e.g., SQL), and 3D plotting (e.g., Tecplot, ArcView) exp. is a plus.
Field Experience: Minimum of 6 mo of field experience is required.

Independent: All candidates must be able to demonstrate experience collecting, analyzing and reporting field data independently, reliably, and on schedule.

Other: Desirable is experience conducting acoustic tag and/or hydroacoustic studies, extended field experience, fisheries research experience, international travel.

Web Site: www.htisonar.com contains further details about HTI products and services.

To Apply: Please do not telephone or drop in at the office. Please email a resume and cover letter detailing qualifications to cmercado@htisonar.com. We will be in touch.

Hydroacoustic Technology, Inc.
715 NE Northlake Way
Seattle, WA 98105
Attn: Personnel
fax (206) 633-5912
support@htisonar.com
HTI is an equal opportunity employer.

Caroline Mercado
Hydroacoustic Technology
715 NE Northlake Way
Attn: Personnel
Seattle, WA 98105
Fax: (206) 633-5912
Email: cmercado@htisonar.com
WEB: http://www.htisonar.com

SCIENTIST: FISHERIES BIOLOGIST, OCEANOGRAPHER, ENG

Job Location: USA, WA Seattle
SCIENTIST, FISHERIES BIOLOGIST, OCEANOGRAPHER, ENGINEER, OR HYDROACOUSTICIAN
Position: Scientist (Project Leader)
Start Date: Nov-Dec 2006
Salary and Benefits: Very competitive, based on qualifications and experience.
Location: Seattle, Washington
Duties: Responsible for conducting acoustic tag and hydroacoustic fisheries studies, including system deployment and testing, data collection and analysis, interpretation of results, report writing, supervision of personnel, other field duties, and interfacing with clients. Supervises field technicians and data analysts.

Minimum Education Req.: Bachelor degree in a scientific field (e.g., fisheries, wildlife,oceanography, computer sciences, engineering, etc.). Masters degree is a plus.

Independent: All candidates must be able to demonstrate experience collecting and analyzing field data independently, reliably, and on schedule.

Other: The following is desirable but not required: experience collecting, analyzing and reporting acoustic tag and/or hydroacoustic data.

About HTI: HTI is a dynamic company that offers an exciting work environment, with excellent opportunities for motivated individuals. HTI designs and manufactures research grade acoustic tag and hydroacoustic electronics, and conducts fisheries studies in lakes and rivers, at hydropower dams, and at sea.

Closing Date: Open until filled.

To Apply: Email a resume and cover letter detailing qualifications to cmercado@htisonar.com.

Hydroacoustic Technology, Inc.
Seattle, WA 98105
www.htisonar.com

Caroline Mercado
HTI (Hydroacoustic Technology, Inc.)
715 NE Northlake Way
Seattle, WA 98105
Phone: 206-633-3383
Fax: 206-633-5912
Email: cmercado@HTIsonar.com
WEB: http://www.HTIsonar.com

REGIONAL SALES MANAGER - EMA

Job Location: United Kingdom, Fenny Compton
IVS 3D, a leader in 3D visualization software, is expanding and looking for key individuals who share our vision of work ethic and energy to help us promote and further grow the business.
We are currently looking for a qualified Regional Sales Manager, EMA, who will play a central role in helping to further develop business activity already established in the region.
This position will also be responsible for driving new business, building customer loyalty, supporting and promoting IVS's business strategy in the region. This position will be evaluated on the achievement of specific revenue growth, existing account development, and new account acquisitions.
As Regional Sales Manager, EMA, you will negotiate major deals and maintain key customer contacts with senior level executives. This position requires a strong ability to plan, organize and establish priorities to meet or exceed sales quotas, and a demonstrated ability to manage a large territory.
The RSM, EMA will have a proven ability to build and maintain solid customer relationships and will monitor sales and expense performance and initiate corrective actions when necessary. As regional revenue grows, this position will also be responsible to recruit and manage a high-performance sales team, meet or exceed sales objectives, research and develop strategies to open new accounts.
As RSM, you will also have the responsibility to help manage the processes in place for the general customer technical support and customer field training for the region.
It will also be expected that the RSM, EMA would assist in direct and indirect marketing development in the region, and to back loop customer comments and feedback on our product offerings.
Candidates will typically have 5 or more years experience executing strategic sales initiatives with a demonstrated ability to achieve sales goals.
Experience in selling products to the following markets is extremely helpful: hydrographic, ocean mapping, upstream oil & gas exploration, sonar, and general GIS industries.
Candidate will have excellent analytical and troubleshooting skills, written and oral communication skills. Requires Bachelor's degree (or equivalent), and the ability to maintain focus in a changing and diverse environment.
Business travel of approximately 50 percent yearly is expected for this position.

Duncan Mallace
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☒ Publication required. Will be printed in the November 2006 issue of this publication. ☐ Publication not required.

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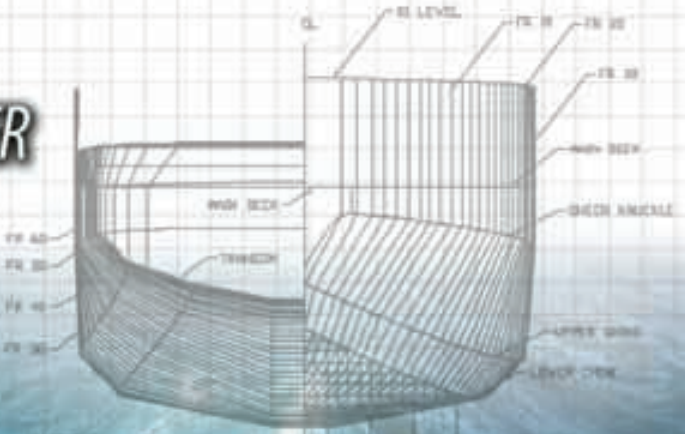

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