Preview: Oceans 2005 • Benthos Founder Retires • Human Powered Sub Race Results

MARINE TECHNOLOGY REPORTER

September 2005
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New England
Hotbed for Marine Tech

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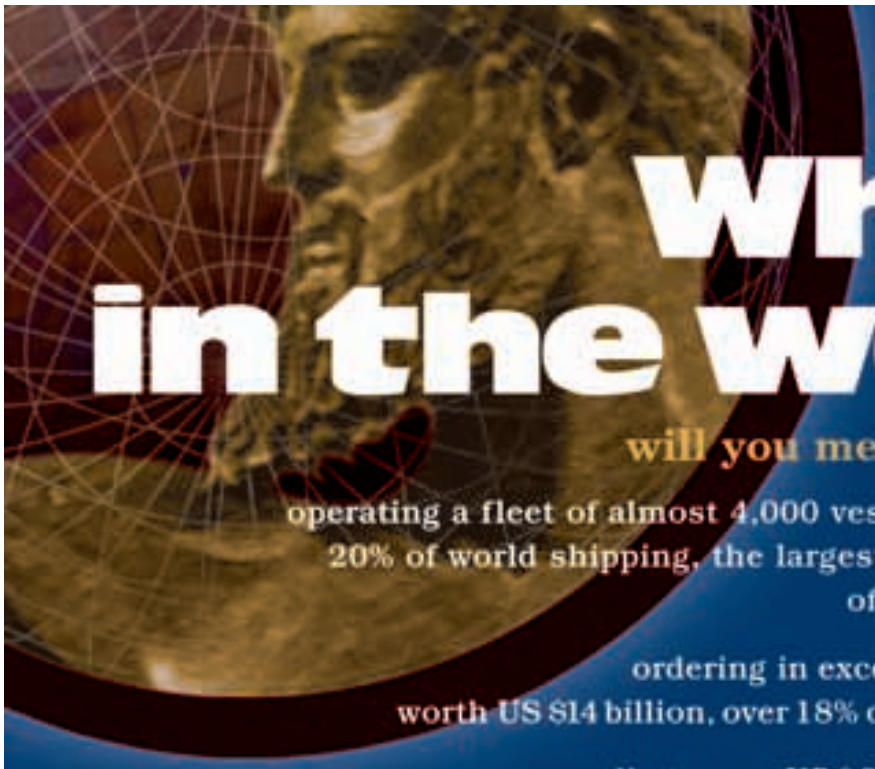
Navy Evaluates New Systems

Underwater Security
Keeping Ports Safe



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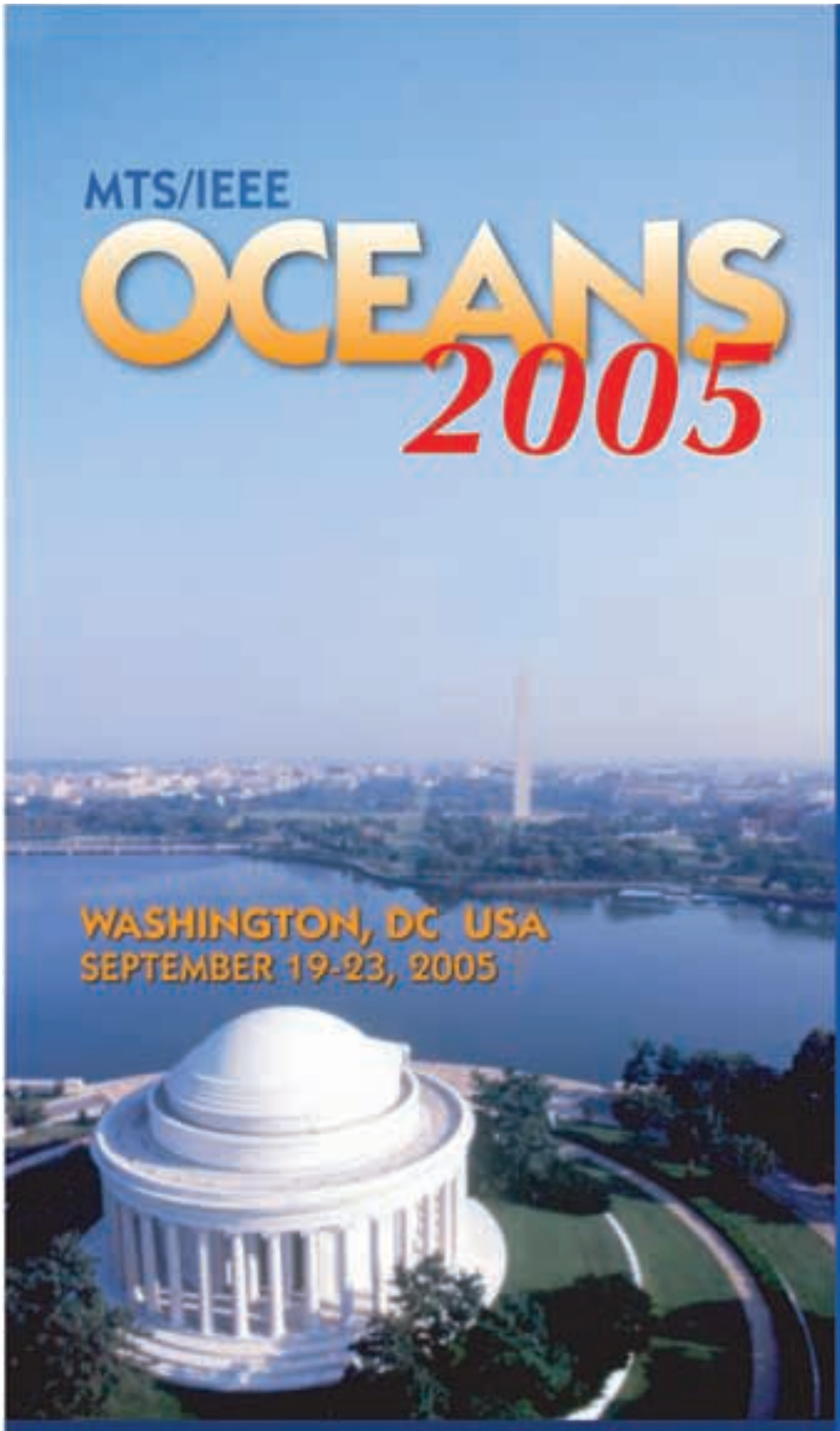

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Photo courtesy of JakeMcGuire.com and WCTC

September 2005

contents

Marine Technology Reporter • Volume 48 • Number 2

on the Cover

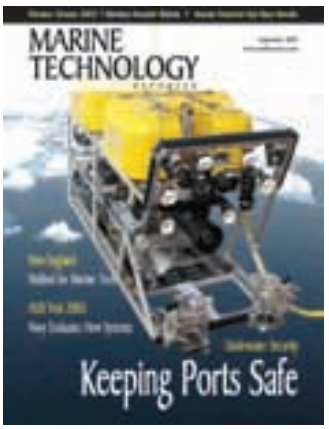
Deep Sea Systems International (DSSI) of Cataumet, Mass., delivers advanced zero visibility port security ROV vehicles. DSSI's Sea Max Mk-2 Port Security ROV System included a vehicle with the sensors and equipment required for maneuvering and positioning using high resolution sonar and video imaging.

the Authors

Maggie Linskey Merrill is the founding editor and publisher of *Marine Technology Reporter*. She has 20 years experience communicating marine science, technology, environmental and engineering news and information. She has held positions at the Woods Hole Oceanographic Institution, Massachusetts Institute of Technology, HA Perry Foundation and Sea Data Corporation. In 1993 she founded *MTR* and the Marine and Oceanographic Technology Network (MOTN). **(Story on page 26)**

Frequent contributors to the Marine Technology Reporter, Maritime Reporter & Engineering News, and Maritime Security Sourcebook, **Chris Doane** (left) is the Chief of Port Security and Response for Coast Guard Atlantic Area. **Joe DiRenzo III** (right) is Atlantic Area's Anti-Terrorism Coordinator. Both are retired Coast Guard officers. **(Story on page 34)**

also in this Edition



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editorial

Technologies designed to better monitor and detect underwater conditions — for the purpose of national security, science or commerce — is progressing at breakneck speed, as evidence of the content of this edition. Familiar drivers for better performance, the government and military, are ramping up spending on products and systems designed discover and mitigate underwater threats, whether is be mines in foreign waters or terrorist intruders on U.S. shores.

Naval Sea Systems Command Warfare Center Keyport division earlier this summer hosted the sixth annual Autonomous Underwater Vehicle (AUV) Fest, to demonstrate AUV systems emerging from the Future Naval Capabilities program. A review of some of the systems put to the test starts on page 22. A report on port security, specifically the Coast Guard's new Underwater Port Security System, starts on page 37.

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

Editorial Index

Companies with editorial mention in this edition

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New Speed Record Set at International Sub Races

New world speed records were set earlier this month in both men's and women's divisions of the International Submarine Races, an engineering design competition that challenges the creativity of underwater inventors and entrepreneurs.

One and two-person teams from the U.S., Canada and the Netherlands battled it out against the clock in the week-long biennial event held at one of the world's largest indoor tanks -- the Naval Surface Warfare Center's Carderock Division David Taylor Model Basin in Bethesda, MD.

Omer 5, a sleek two-person submersible from the University of Quebec's Ecole de Technologie Superieure (ETS) in Montreal, Canada, set a new two-person speed record of 7.061 knots. The Canadians' women's team also set a new record of 5.885 knots.

The fastest high school speed mark was set by SubLime, a team from Spring Hill High School in Hernando County, FL, that clocked a run of 4.81 knots. A SubLime woman team member also claimed the record speed, 4.828 knots, in the one-person design category.

Judges awarded the top prize for the Best Overall Performance to a submarine called

Participating teams

- Everett Community College, WA
- US Merchant Marine Academy
- Sussex County Technical School, NJ
- Virginia Tech
- Florida Atlantic University
- University of Washington
- Hernando County (FL) Schools
- Villanova University
- University of Michigan
- Millersville University
- University of Quebec (ETS), Montreal
  Ecole Polytechnique de Montreal
- Texas A&M University
- Technical University of Delft, Netherlands
- Independents: Don Burton, Bruce Plazyk,
- Wheaton Submarine Works (2 subs)

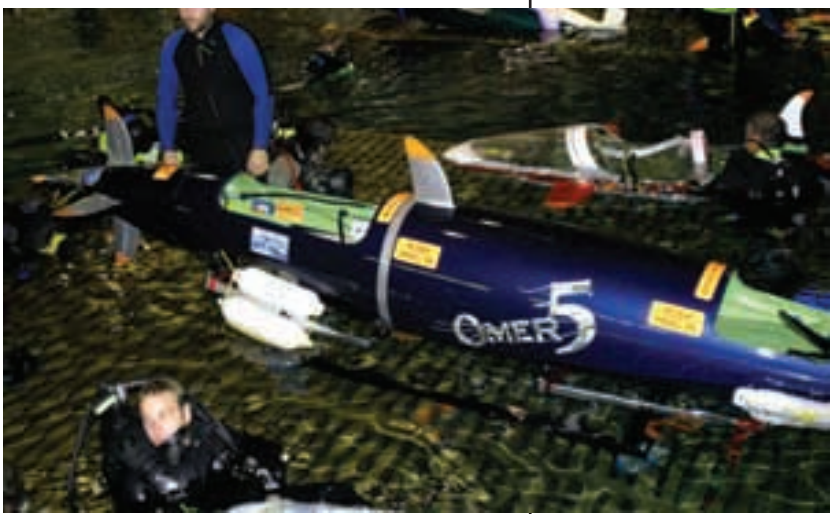
Competitors gathered at Naval Surface Warfare Center's Carderock Division David Taylor Model Basin in Bethesda, MD, for the International Submarine Races.

(Photo Credit: Mariby Johns for ISR)

Wasub from the Technical University of Delft in the Netherlands. Placing second for overall performance was FA-U Boat from Florida Atlantic University, and third was SubLime, the high school team from Spring Hill, FL.

The top Innovation Prize went to Virginia Tech's Phantom 5. Finishing second and third were independent entrants Don Burton's Sparky's Sub and Bruce Plazyk's Faux Fish. Florida Atlantic University also won the "Smooth Operator" award, a prize given to the team with the most consistent performance, successful troubleshooting and ability to race the course.

Some of the hottest competition during the week was between Omer 5 and the new team from the Technical University of Delft. The event ended with a first-time ever, two-boat side-by-side duel between the two, won by Wasub. The Dutch sub ran straight and true while the faster Omer 5 took a commanding three-boat-length



Omer 5 from the University of Quebec's Ecole de Technologie Superieure (ETS) set a new two-person speed record of 7.061 knots.

(Photo Credit: Mariby Johns for ISR)

lead, only to miss the final gate and be disqualified. Both boats used computer-aided variable pitch propellers. Also the first time in ISR history, the event included a slalom course, in which submarines were required to maneuver through a set course of underwater pylons. The top three finishers were Wasub, Ol' Sarge II and FA-U Boat.

In other awards, Umpty-Squatch II, the team from the Sussex, N.J., Technical High School, won the prize for Best Use of Composites. The judges said the team used composite technology to create "special contour and surface variations necessary to achieve their vehicle's design requirements."

An award chosen by the nearly 300 sub team participants, the Spirit of the Races Prize, went to the team from the Technical University of Delft.

Wasub's 20-plus member team also won the prize for Best Design Outline. Teams must make a formal 20-minute technical presentation to ISR judges and submit a written outline of their design and construction program. This was the first year that TU Delft had competed. .

The SubLime high school team from Spring Hill, FL, was awarded the Judges' Prize, given in respect for sponsors Steve and Patricia Barton's many years of participation in the competition.

In the speed categories, here's how they finished: two-person propeller academic, Omer 5, 7.061 knots; FA-U Boat, 6.100; Archimede 3, Ecole Polytechnique de Montreal, 5.225. One person propeller, Wasub, 6.903; Ol' Sarge II, Texas A&M, 5.382; and Sublime, 4.828. In the independent category, two teams from Wheaton, MD, Sub Works finished tops in their class, Scuba Doo Two at 4.642 knots and Sub Taxi, 3.897. In the non-propeller category, the academic winner was Manatee from the U.S. Merchant Marine Academy. The independent winner was Bruce Plazyk from Chicago.

This was the fifth staging of the event in the 3,200-foot-long (975 m) David Taylor test tank at NSWC. The submarine race is a contest that began in 1989 and has grown to include the participation of universities, colleges, corporations, research centers, high schools and privately sponsored teams from the North America and Europe. Typical teams consist of student athlete/engineers, wearing scuba gear as the subs are "wet", meaning filled with water. Team propulsors provide power and navigation as their subs run a 100-meter course against the clock along a fixed underwater course. The principal objective is education: encouraging creativity and innovation in the use of teamwork, planning, materials, hydrodynamic design, buoyancy, propulsion and underwater life support.

"The Naval Surface Warfare Center has been proud to host the 2005 International Submarine Races at its David Taylor Model Basin," said Captain Charles D. Behrle, USN, Division Commander. "We were pleased to be able to once again support such an outstanding educational and engineering endeavor." ISR Executive Director Nancy Hussey thanked the Navy. "Without the invaluable support of the Navy, none of this would be possible," she said. "We are deeply grateful for their endorsement and technical assistance." Mrs. Hussey also thanked Carderock officials, particularly ISR liaison chief Dan Dozier, who provided "countless hours of vital assistance in making the competition such a success."

The building of human-powered sub-

Navy Safety Divers were on hand to ensure the safety of all competitors.

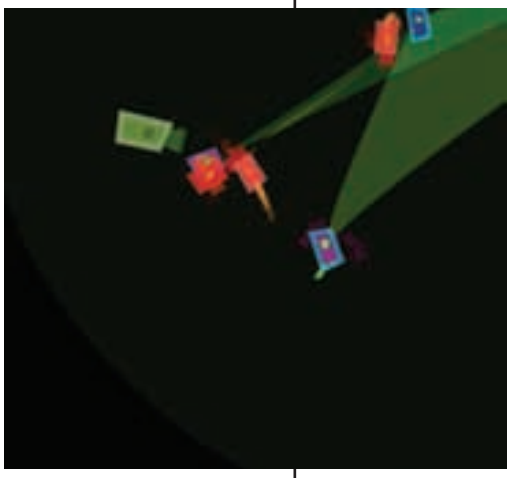
(Photo Credit: Mariby Johns for ISR)

marines dates back more than 200 years. Contemporary submarines represent many months, if not years, of effort in labs, workshops and garages by engineering students or individual entrepreneurs. Mr. Plazyk's Faux Fish, for example, was five years in design and construction of its three-part articulated fishtail propulsion system. The goal of all competitors is to design an underwater vehicle that can be powered successfully by scuba-clad teams through the course without malfunctioning, crashing into the bottom, popping to the surface or simply failing to move through the water.

Bruce Plazyk's Faux Fish.

(Photo Credit: Mariby Johns for ISR)

Science as Art



A Seattle technology firm, HTI (Hydroacoustic Technology, Inc.) is helping make waves in England's art scene through the creative works of a digital artist from the UK. That artist is Julie Freeman and her exhibition is called The Lake, a new installation at the Tingrith Fishery in Bedfordshire (approx. 40 minutes northwest of London). Her project consists of sixteen fish, an assortment of tench, rudd, goldfish and carp that are being tracked in real time with the most advanced fish tracking system in the world. Ms. Freeman's project is like nothing ever done before in what the BBC World Service refers to as "ground-breaking high-tech art". The artist's vision came by way of nature and technology working together. Through tracking each fish with a small implanted acoustic transmitter she was able to see the fish behaviors within their environment. The transmitters ping every two seconds to underwater microphones (hydrophones), sending information to a laptop that reveals their location, tracking their movements in real time 3-D animation. The artist wrote her own software that generates a creative interpretation of the fish movement. Her program also orchestrates unique sounds that correspond to the behavior of the fish. One experiences these visual and aural treats inside a 20-ft. tall recycled silo housing near the pond. Inside, across the silo's ceiling one finds a stretched canvas membrane where Freeman's art of the fish movement is projected. You'll also hear the random "fish concerto" played via loudspeakers as created by her use of recorded natural sounds. The exhibit offers us a beautiful experience in the private, everyday lives of fish. For information about this exhibit visit www.juliefreeman.co.uk,and to learn more about acoustic tagging technology visit www.HTIsonar.com.

Congress Upgrades Appropriations Process

The Fiscal Year 2006 appropriations process gets a new look in the House of Representatives. Its Appropriations Committee already drafted its first two FY 2006 appropriations bills (Interior and Homeland Security). According to the American Association for the Advancement of Science, Congress is tackling the FY 2006 appropriations process in a newly reorganized committee structure. Instead of the traditional 13 subcommittees in each chamber writing 13 appropriations bills over inordinate amounts of time, the House shuffled subcommittee jurisdictions to consolidate into 10 subcommittees and 11 bills. The Senate chose 12 subcommittees with jurisdictions similar to, but not identical to, the House. The federal R&D portfolio would be divided among 10 of the 11 House appropriations bills and 10 of the 12 Senate bills. In late May, the House Science, State, Justice, Commerce & Related Agencies Appropriations Subcommittee approved a $57.8 billion spending bill for FY 2006. The bill — which provides funding for the National Science Foundation, the National Oceanic & Atmospheric Administration, and the National Aeronautics & Space

(Continued bottom of page 12)

Studying Dolphins to Improve Sonar

Professionals and students from the University of Hawaii (UH) are currently studying dolphin hearing and echolocation - the use of sound waves to "see" - to help the Navy improve mining and sonar techniques and make the oceans safer for marine mammals. The research is being conducted through the joint Marine Mammal Research Program, located at Marine Corps Base Kaneohe Bay, Hawaii.

"We do research on hearing primarily because we're concerned about the loud sounds in the ocean and its effects on the animals," said Marine Mammal Program Director Dr. Paul Nachtigall. "We research echolocation because we're interested in duplicating the fine capabilities of the dolphins' echolocation."

Two bottlenose dolphins, BJ and Boris, and a false killer whale, Kina, are helping scientists better understand echolocation and hearing safety for marine mammals.

The dolphins at the research program are demonstrating just how valuable their sonar is. BJ is able to find a piece of metal through two feet of mud, and she's able to tell researchers whether it's brass or stainless steel. She does this by either touching a ball to indicate steel, or remaining motionless to indicate brass. Boris has helped to develop a temporary threshold level for dolphins, giving the Navy a starting point to begin regulating operational sound. The Office of Naval Research provides the majority of the funding, and also has an agreement with Marine Corps Base Hawaii's commanding general to use the base facility. The University of Hawaii provides the program with employees, volunteers and students. Besides conducting research, the facility is equipped with a complete laboratory, surgery, and necropsy facility for mammals that become stranded around Oahu. "Stranded animals that come in are quite often very sick," said Kristen Taylor, UH zoology graduate student intern. "Their main sense is hearing, so we have to make sure it's good before we release them."

Researchers use a method similar to the one used to measure human hearing.

"We play loud sounds for the animal to see what the effect is on their hearing and look for the small shift in hearing," Nachtigall said. "That shift gives us a benchmark of where to start to regulate the sound." The Navy commits nearly $10 million annually in research to better understand how marine mammals hear and how they may be affected by man-made sound. Seismic disturbances, snapping shrimp and sounds from other ocean dwellers, rain, lightning strikes, and man-made sounds such as offshore drilling, seismic surveys, commercial shipping and other ship sounds, fishing boats, recreational boating, and sonar use contribute to the background sound in today's oceans. "[The dolphin's] bio sonar is just superb," Nachtigall said. "We're interested in the fact that [BJ] can do that, but we're much more interested in how she does that. So, we do experiments that look at the acoustics that tell us how she's able to do that. We build algorithms and pass that information on to the people who build sonar."

— By Journalist 2nd Class Jessica B. Davis, U.S. Pacific Fleet Public Affairs

A female bottlenose dolphin named BJ performs her daily exercises while her trainer, Dera Look, supervises at the joint Marine Mammal Research Program on board Marine Corps Base Kaneohe Bay, Hawaii. Professionals and students from the University of Hawaii are studying dolphin hearing and echolocation (the use of sound waves to see). The research will improve the Navy's mining and sonar techniques and make the oceans safer for marine mammals.

(U.S. Navy photo by Journalist 2nd Class Jessica B. Davis)

Wilcoxon Research Awarded ONR Contract

Wilcoxon Research, a supplier of vibration sensors, won a multi-million dollar research contract with the Office of Naval Research (ONR), Arlington, Va., to provide sensing technology concepts for future naval systems.

The contract includes two stages to adapt and then miniaturize existing Wilcoxon sensing technology to provide a suite of Vector sensors. The sensors are a part of concept technologies that ONR may develop for clandestine undersea surveillance to detect and report the location of submarines in far-forward and contested waters. The estimated total for the multiple contracts awarded under this program is $40 million, of which $3 million is for Wilcoxon's individual contract. The contract extends for a period of two and a half years, with options worth an additional $5.2 million.

The Vector sensor was designed for detection and localization of underwater acoustic signals under a current NAVSEA funded Phase II SBIR program. In Stage 1 of the ONR contract, the Vector sensor will be adapted to provide even more accurate directional information. In Stage 2, Wilcoxon will develop a smaller, low profile

design of the modified sensor, including multiple frequencies, to deliver a suite of Vector sensors.

Underwater Vector sensors and Vector sensor arrays can improve the detection and localization of acoustic signals. In addition to detecting submarines, the Vector sensors can be used to protect port entrances, nuclear power plant cooling water in- and out-flows, military piers, shore-based manufacturing plants, shipyards, and oil platforms, all of which are potentially vulnerable points of entry for intruders. Acoustic detection of an intruding force, such as a swimmer, diver, unmanned underwater vehicle, submarine, or surface watercraft would give security personnel time to potentially prevent the attack on the facility before it occurs.

(Continued from page 10)

Administration — proposes discretionary funding levels that are just over 2% percent above last year.

While the total funding levels for each agency have been released, very little information is available about how support would be allocated within each agency. Full committee consideration is expected June 7, after the Memorial Day recess.

NSF would receive a total of $5.64 billion, $171 million over last year and $38 million above the budget request. NOAA would receive $3.43 billion, $496 million below FY 2005 and $152 million below the budget request.

The only information available on how the funds would be allocated among the NOAA line offices suggests that the National Weather Service be funded at or above the requested level.

And NASA would receive $16.5 billion, an increase of $275 million above FY 2005 and $15 million more than the budget request.

Did You Know?
In New England in 2004, the Marine Science & Technology Industry included 481 firms in the marine science and technology cluster directly employed more that 39,000 people in New England and produced annual sales worth over $4.8 billion.

(See feature story on page 26)

Stena Drilling Orders New Drillship

Stena Drilling ordered a $600 million drillship at Samsung Shipyard in Korea, bringing its fleet to six. Of its current fleet of five semisubmersibles, two are active offshore Norway, one offshore Great Britain, one offshore Mauritania and, in the near future, one offshore Australia.

Stena Drill Max will be dynamically positioned with six propellers and will have a total displacement of 105,822 tons. "Believing in a sustainable high oil price and demand for both oil and gas, we feel confident this vessel will find a profitable contract and productive employment on delivery," says Tom Welo, Managing Director of Stena Drilling in Aberdeen.

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

Remote Minehunting System Approved for Production

Assistant Secretary of the Navy for Research, Development and Acquisition John J. Young, Jr., approved for production the AN/WLD-1 Remote Minehunting System (RMS) on Jul 1.

RMS is one of several next-generation organic mine countermeasure systems being developed by the Program Executive Office for Littoral and Mine Warfare (PEO LMW).

"Under the leadership of Secretary Young, the Chief of Naval Operations, and in close partnership with the Fleet, the Naval Sea Systems Command Warfare Centers and our industry partners, we are now in a position to deliver real capability to the war fighters," said Rear Adm. William E. Landay, III, program executive officer for LMW. "The approval of RMS for production is another success story in our ongoing effort to claim ownership of the littoral. RMS and the other systems we are acquiring will help assure access for U.S. and joint forces. As the CNO has noted, our naval and military success depends upon access, speed and persistence." Recent at-sea system qualification testing, witnessed by Commander, Operational Test Force personnel demonstrated acceptable RMS performance to warrant the low-rate production decision.

PEO LMW's Mine Warfare Program Office (PMS-495) is extremely pleased with the RMS's capability and demonstrated performance, according to Gary Humes, program manager. "During at-sea testing, the system met or exceeded all its critical performance parameters and demonstrated the ability to provide a significant

operational advantage to our current minehunting capability," said Humes.

Operating from DDG 51-class Flight IIA destroyers and the new Littoral Combat Ship, the RMS will provide continuous, unmanned, over-the-horizon capability to determine the presence or absence of mines. The RMS uses a diesel powered semi-submersible vehicle, 23 ft.(7 m) long, 4 ft. (1.2 m) diameter, and weigh-

Did You Know?

Concerns are being expressed over the receding levels of water in Lake Victoria that could affect marine activities. Marine experts and transporters are describing the recent recession of water levels as abnormal and alarming.

(Source: The East African Standard (Nairobi))

Bibby Charters DSV

Bibby Offshore Limited entered a long-term agreement to charter a new 308.4 ft. (94 m) DSV/Construction Support vessel, built in Norway's Aker Langsten Shipyard.

The vessel, to be named Bibby Sapphire, is owned by Volstad Maritime AS. It will be available to the North Sea construction market from early August 2005.

Following the addition of a full 15 man Saturation Diving system, the vessel will also be available for diving work from the start of 2006. The DSV will be the first vessel of its kind to enter the North Sea region for some years. The vessel has been specifically chosen by Bibby Offshore to best serve the requirements of its clients. It is fitted with a 150-ton heave compensated crane, has accommodation for 197 personnel onboard and has extensive working deck available for project equipment. The dive spread, which will be installed during the winter of 2005, will initially be a twin bell 15-man system, extendable to 18-man with hyperbaric lifeboat modifications, capable of working at water depths of 300 MSW. The vessel is fitted with a Class II dynamic positioning system and is F1-F1 2 rated, with a transit speed of 15 knots.

For more information visit www.maritimee-quipment.com/mt & Click No. 7

Did You Know?
FAU's $11 million marine science research center at Harbor Branch Oceanographic Institution's campus on the Indian River Lagoon will open next summer and will be the first step in bringing science degree programs to the Treasure Coast.

(Source: www.tcpalm.com)

ing 13,000 pounds towing an AN/AQS-20A sonar mine detecting set to detect, classify, and localize volume, tethered, close-tethered, and bottom mines for Strike Group avoidance or organic mine clearance. The system also has the capability to properly identify close-tethered and bottom mines using an electro-optical ID system.

Lockheed Martin, Maritime Systems & Sensors, Undersea Systems in Syracuse, NY, is the prime contractor for the RMS program. Under the fixed price incentive contract for low rate initial production, Lockheed Martin will produce three vehicles in fiscal year (FY) 2005. The Navy plans to acquire a total of 47 RMS systems between FY 2005 and FY 2011.

The PEO LMW develops, acquires and maintains operationally superior, affordable systems to provide assured access for U.S. and coalition forces in the littoral battle space. These include programs in support of Mine Warfare, Littoral Combat Ship Mission Modules, Unmanned Underwater Vehicles, Maritime Surveillance Systems, Afloat Anti-terrorism/Force Protection, Explosive Ordnance Disposal and Naval Special Warfare.

New Method for Imaging

The December 26, 2004, earthquake in the Indian Ocean that generated the enormous tsunami that led to untold devastation was one of the largest earthquakes ever recorded. Seismologists are using new methods to detail the processes that unfolded during the event, known as the Sumatra-Andaman earthquake.

Scientists at Scripps Institution of Oceanography at the University of California, San Diego, in collaboration with scientists at the University of California, Los Angeles, have developed a new method for imaging how the earth ruptured during the quake, which is providing a fresh perspective of the massive event. In this method, the scientists use the first-arriving seismic

waves generated by an earthquake to produce detailed images within 30 minutes of an event, a development that could have implications for public-warning and tsunami-alert systems. The method traces seismic waves back to their original rupture source. In the case of the Sumatra-Andaman event, they used the Japanese Hi-Net array, consisting of about 700 high-quality seismometers, as antennae to track the seismic sources. "If you were at a pond and dropped a pebble, you would see a ripple appear in the water. If another person only saw the ripple, they could still probably guess where you dropped the pebble by tracing the rings back to the center. That's exactly what we are doing. We are looking at how the ring of seismic waves is approaching the array to find out where the rupture is occurring," said Ishii, the Cecil H. and Ida M. Green Scholar at Scripps. For the Dec. 26 event, the scientists obtained a series of rupture points progressing from south to north in the Sumatra-Andaman region. Called "back projection," the method is not unlike those used to find sources of oil and gas and by astronomers to image distant galaxies.

Seawatch Buoys Deployed

In recent months, 12 additional Seawatch buoy systems have been added to the network, playing an expanding role in regional networks of the Global Ocean Observation System (GOOS). "This, in turn, leads to further strengthening of the Seawatch Partnership Forum - a key element in encouraging the establishment of common standards and operating practices as well as providing a forum for the exchange of ideas on future developments," said Frode S. Berge of Fugro OCEANOR. The buoy network off the coasts of Spain comprises 14 measurement locations that are part of the Puertos del Estado's (Coast and Harbor Authority's) buoy network, and monitoring the sea state in the vicinity of major ports. The two most recent buoys were provided in 2004. Fugro OCEANOR was then re-awarded the contract in late 2004 to operate and maintain the Spanish deep sea buoy network through 2006 - a further three buoys will be supplied to Puertos del Estado in 2005. A network of 12 multi-sensor OCEANOR Seawatch and Wavescan buoys was provided to the Puertos del Estado in 1997 for the warning and observation network for the marine environment in Spanish coastal waters. Sea state monitoring combined with ocean wave modeling helps the efficient operation of Spain's harbors, with all data accessible through dedicated Internet web pages. In addition to three navigation radars, the buoys are deployed in the Bay of Biscay, the Mediterranean Sea, the Strait of Gibraltar and in the waters around Gran Canaria, Canary Isles.

Sonar Test Engineer Covered by LHWCA

The U.S. Court of Appeals for the Second Circuit ruled that a sonar test engineer comes under the coverage of the Longshore and Harbor Workers' Compensation Act (LHWCA). In the instant case, the engineer spent about 40 percent of his time conducting tests on sonar transducers onboard a barge permanently moored in Cayuga Lake in upstate New York. Cayuga Lake is connected by locks to the Erie Canal, which is connected by locks to both the Hudson River and Lake Erie. Even though Cayuga Lake does not currently support interstate commerce, the court held that, since it is physically capable of such support, the lake is navigable for purposes of the LHWCA. Since a substantial portion of the engineer's work was performed on a floating object on navigable water and he drowned when he fell from the shuttle boat carrying him ashore, the court held that his widow was entitled to death benefits under the Act. Lockheed Martin Corp. v. Morganti, No. 04-0500 (2nd Cir.) (HK Law)

Cable Layer Converted Into Pipe Layer

Last December, Ulstein Verft AS won the contract to convert Solstad's cable-laying vessel Normand Clipper into a pipe-laying and offshore construction vessel. The conversion work -- as extensive as the building of a new platform supply vessel -- was scheduled to be finished by the end of May.

"Preparatory work began in December 2004, when the rigging and cable-laying equipment was brought ashore," said Lidvar Lillerovde, Project Manager at Ulstein Verft. "Bunkers still inside the vessel were removed, and the tanks drained of gas. In January this year, workers began to cut away the hangar, remove equipment and build sections, but shipyard workers could not fully begin the work until mid February. By that time, the vessel had entered dry dock."

"The yard has assigned many workers to the task and there is the ability and determination to deliver on schedule. In addition to this, the charterer has made a number of requests during the conversion process, which have led to minor modifications being carried out - these demands have been tackled on the spot," said Captain Erling Sandviknes of Solstad.

Normand Clipper will have a 250-ton heave-compensated offshore crane mounted in August. Ulstein Verft will erect the crane pedestal and carry out preparatory work to enable the crane to be mounted on the port side of the vessel. A new transformer and switchboard room, which ensures the power supply for the crane, has also been installed. The 25-ton crane, which used to stand on the port side, has been relocated to the starboard side, and has been upgraded for work down to a depth of 500 m.

The vessel used to accommodate a crew of 70. That capacity is adequate for pure pipe-laying assignments, but more hands are needed for the more demanding construction jobs.

"This challenge is met by the upgrading of existing accommodation, and by extending the superstructure towards the stern. We have put in extra cabins, an ROV hangar for remotely controlled mini-submarines, an ROV control room, an office and a conference room. We will now be able to accommodate a crew of 102. We have also fitted new life-boats and davits to comply with the NIS requirements for crews of this size," Lillerovde says.

The vessel has increased its breadth from 76.7 to 88.5 feet (23.4 to 27 m) by adding sponsons. "These sponsons are drawn right up to the wheelhouse midships," said the Project Manager. "The sponsons extend the deck sideways, accommodating bulky deck equipment such as pipe carousel, but they also compensate for the readjustment of weight that is required when the largest crane is swung over the ship´s side. As a consequence of the sideways extension of the vessel, new crane base, ROV module and living modules, the added weight of new steel in the hull is estimated at approximately 1300 tons."

"For the vessel being capable of carrying a full load of pipes and equipment for pipe-laying and construction work, the working deck had to be reinforced. We have halved

(Continued on page 21)

After conversion, Normand Clipper will look quite like her sister Normand Cutter.

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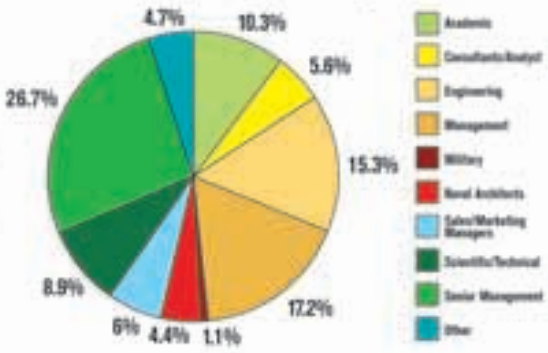

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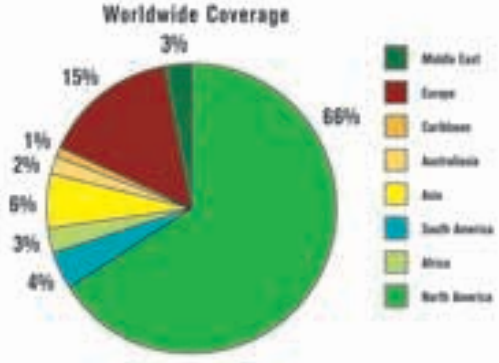

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MTR EDITORIAL CALENDAR

September 2005

AD CLOSING DATE: **AUGUST 15, 2005**

FEATURE:

Maritime Security & Undersea Defense

PRODUCT REVIEW:

Deck Machinery, Ropes and Cables

DIRECTORY:

Communication Equipment & Services

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Oceans 2005 Sept. 19 - 23, 2005, Washington DC

U.S. Maritime Security Expo Sept. 20-21, 2005, New York, NY

25th Annual Conference of the Underwater Mining Institute Nov. 1-6, 2005, Monterey, California

SNAME Maritime Technology Conference & Expo and Ship Production Symposium Oct. 19-21, 2005, Houston, TX

Subsea Houston Sept. 20 - 22, 2005, The Woodlands, TX

Dynamic Positioning Conference 2005 Sept. 27-28, 2005, Houston, TX

UUVS: Seventh Unmanned Underwater Vehicle Showcase Sept. 29-29, 2005, Southampton, UK

National Maritime Salvage Conference 2005 Nov. 1-3, New Orleans, LA

Offshore Communications Nov. 1 - 4, 2005, Houston, TX

April 2006

AD CLOSING DATE: **MARCH 11, 2006**

FEATURE:

The Offshore Technology Edition

The ability to discover and recover natural resources in increasingly deep and hostile waters is largely dependent on emerging marine technologies.

PRODUCT REVIEW:

Sonar Systems & Seafloor Mapping

DIRECTORY:

Environmental Monitoring & Remote Sensing

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OTC 2006 May 1-4, Houston, Texas

2005-2006

November 2005

AD CLOSING DATE: **OCTOBER 11, 2005**

FEATURE:

Seafloor Engineering

Discovering and recovering information from below the ocean requires increasingly advanced engineered systems and products. Profiled are the top five new developments in the works.

PRODUCT REVIEW:

Salvage Vessels & Equipment

DIRECTORY:

Undersea Vehicles & Imaging

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The International Workboat Show Nov. 30 – Dec. 3, 2005, New Orleans, LA

Marintec China 2005 Dec. 6-9, 2005, Shanghai, China

SEG/Houston 2005 Nov. 6-11, 2005, Houston, TX

January 2006

AD CLOSING DATE: **DECEMBER 11, 2005**

FEATURE:

Marine Science Institutions

Profile of the leading institutions serving as centers for marine science research

PRODUCT REVIEW:

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DIRECTORY:

Electronic Charting & Vessel Management

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Underwater Intervention 2006 Jan. 30 – Feb. 1, 2006, New Orleans, LA

Pacific 2006 Jan. 31 – Feb. 3, Sydney, Australia

World Maritime Technology Conference March 6-10, 2006, London, UK

March 2006

AD CLOSING DATE: **FEBRUARY 11, 2006**

FEATURE:

AUVs; ROVs; UUVs

Underwater vehicles of every size, shape and capability are assisting government, military and private institutions to harvest the ocean's potential.

PRODUCT REVIEW:

Communication Equipment & Services

DIRECTORY:

Oceanology International 2006 Exhibitor's Guide

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Oceanology International 2006 March 21-23, 2006, London, UK

Interspill 2006 Conference & Spill International 2006 Exhibition March 21-23, 2006, London, UK

GEO 2006: 7th Middle East Geosciences Exhibition and Conference March 27-29, Bahrain

May 2006

AD CLOSING DATE: **APRIL 11, 2006**

FEATURE:

The Communications Edition

A voracious appetite for seamless data collection and dissemination drives developments in communication hardware and services.

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Diving

DIRECTORY:

The MTR 2006 Annual Directory

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ISOPE-2006: 16th International Offshore and Polar Engineering Conference & Exhibition May 28, 2006 – June 2, 2006, San Francisco, CA

June 2006

AD CLOSING DATE: **MAY 11, 2006**

FEATURE:

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Marine Technology Reporter presents detailed analysis on the 200 leading companies, institutions and individuals that are proven leaders of the marine science and underwater technology industry.

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Undersea Vehicles & Imaging

DIRECTORY:

Communications, Telemetry & Data Processing

July 2006

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The Ocean Engineering Edition

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DIRECTORY:

Deck Machinery, Ropes, Cables & Connectors

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SMM 2006 Sept. 26-29, 2006, Hamburg, Germany

SNAME Oct. 10-13, Ft. Lauderdale, FL

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FEATURE:

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Autonomous Underwater Vehicles (AUV)	16.2%	Oceanographic Instrumentation	31.4%
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Buoys	44.6%	Offshore Structures	10.8%
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Cable Layer Converted Into Pipe Layer

(Continued from page 17)

the distance between ribs and strengthened several decks. While the deck could previously support 3 tons per square meter, it is now able to support 10 tons per square meter," said Lillerovde.

Upgrading of DP2

"A moon pool has been installed in the deck to enable equipment to be lowered down for subsea operations. For such assignments, the vessel must have strong motors and propellers, as well as a dynamic positioning system (DP) that guarantees the vessel's positional stability, regardless of weather or conditions at sea. The vessel was already equipped with a DP2 system, but this has been upgraded with new reference equipment and other features. In order to manage construction and pipe-laying assignments, the bridge has been rearranged, the DP desks on the bridge have been moved aft, and new maneuvering desks have been fitted in aft for complete control. With future demands from authorities in mind, we have also mounted a Voyage Data Recorder (VDR) on the bridge, which processes signals, through 70 different cables, from all machinery onboard," he said.

The converted Normand Clipper is due to leave Ulstein Verft in the end of May this year, bound for Newcastle, where the vessel will report for duty on four assignments for Technip Offshore.

"We will take on board two ROVs and four drums for umbilicals and flexi pipes," said Captain Sandviknes. The umbilicals are cables that provide sub-sea and other installations with among other hydraulic, fiber optic and electric power. Flexi pipes are designed to conduct gas and oil between installations on the sea bed.

"Three of the assignments are inside the English sector, and involve laying umbilicals and flexi pipes. The key project is the laying of the principal umbilical from Melkøya off Hammerfest, Norway, and out to the Snøkvit oil field. We will have a 65.6 ft (20-m) diameter carousel mounted for this assignment, around which we will wrap the umbilical. This assignment will last just under a month and a half."

These assignments came to an end mid August. The vessel will then head for Kristiansand, Norway, where National Oilwell will deliver and mount the fully integrated 250-ton crane.

"The crane will undergo testing, after which we will probably begin another assignment which will take us up to the 1st of November. As of that date, we will have a 180-day contract with the Australian company, Clough Ltd. We will take onboard complete deck equipment, i.e. eight flexi-pipe rails and new ROVs. Thereafter, we head for the East coast of India to lay flexi pipes. The agreement with Clough Ltd. contains an option to extend the agreement for up to five more years, in direct continuation of the fixed period," said Sandviknes.

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Normand Clipper in April.

New Tech on Tap at

AUV Fest '05

For ten days early this summer, Naval Sea Systems Command Warfare Center Keyport (NWCK) division hosted the sixth Autonomous Underwater Vehicle (AUV) Fest 2005, held from June 6-16, 2005. A primary goal for AUV Fest 2005 - sponsored by the Office of Naval Research (ONR); Commander, Naval Meteorology and Oceanographic Command (CNMOC); and Commander, Naval Undersea Warfare Center (NUWC) - was to demonstrate AUV systems emerging from the Future Naval Capabilities programs for Organic Mine Countermeasures and Autonomous Operations.

ONR Program Manager for Ocean Engineering and Marine Systems, Dr. Tom Swean, said AUV Fests are an excellent way to help advance the fairly new science of undersea robotics. "ONR started investing in unmanned underwater vehicle technology probably about 1991. After a few years, there were enough efforts going on that were starting to gain some maturity, where we were putting things in the water. We thought at that time that it would be a good idea to try and bring the community together at a location periodically to kind of look and see what the state of the art is." AUVs serve a variety of missions ranging from locating mine fields, to intelligence, surveillance, and reconnaissance (ISR) and force protection, to mapping of the undersea environment. AUV Fest 2005 was the largest in-water demonstration event for unmanned vehicles ever conducted, according to Steve Stuart, NWCK event coordinator, both in participation and in the number of technologies demonstrated. In all, there were 168 vehicle team members, more than 200 observers, and approximately 60 test-support personnel who participated in testing AUVs, and supporting technologies. "The demonstrations addressed capabilities applicable to all nine UUV [Unmanned Undersea Vehicle] mission areas addressed in the 2004 update to the Navy UUV Master Plan, " said Stuart.

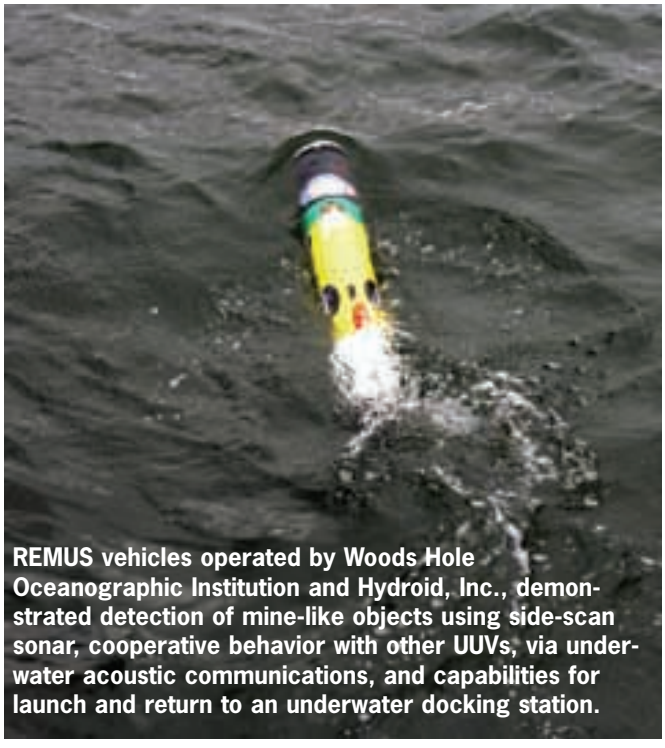
COL William Schopfel (USMC, Ret.), ONR Research Test Director, said, "Being able to test so many technologies at once in one area helps to improve the acquisition of these technologies for the Fleet." The objectives included showing support of mine countermeasure missions, and demonstrating the interoperable communication of data and mission status among various unmanned vehicle systems with a central command node. Stuart said that communication issues were one of the major focal points of AUV Fest 2005. "One of the primary challenges for AUV developers is to adhere to a set of common communication standards," he said. AUV Fest was replete with examples in which communication advancements were hailed as technological advances in the AUV community. Among the advancements were cooperative behavior among multiple AUVs, and communication from the AUVs with a common command and control node operated by the military forces in the field.

Another was the success of the Collaborative Undersea Range Architecture for Test/Training & Experimentation/Evaluation (T2E2) (CURATE). The CURATE implementation gave a glimpse of both the reality of merging a Test and Evaluation (T&E) event with a training event, and enabling the "test anywhere, test anytime" vision.

Stuart explained that CURATE was used in a test and training exercise lasting eight days in which the goal was to integrate environmental and intelligence data, real and simulated AUV/UUV assets, and operational units in a battlespace preparation and mission planning test.

This exercise demonstrated remote and distributed T2E2 capability. The Navy's SEAL Delivery Vehicle Team ONE (SDVT-1) in Hawaii received real, virtual, and constructive data from the Mid-sized Autonomous Research Vehicle, the Solar AUV, the Hydrographic USW Craft, and the simulated 21-in. UUV from which to plan a mis-

The Remote Delivery of Unmanned System Technology (RDUST) project from Naval Surface Warfare Center (NSWC) Panama City demonstrated a capability to launch a REMUS UUV from an Autonomous Search and Hydrographic Vehicle (ASH) USV, as could be used to rapidly insert a slower-speed UUV into a distant mission area.



REMUS vehicles operated by Woods Hole Oceanographic Institution and Hydroid, Inc., demonstrated detection of mine-like objects using side-scan sonar, cooperative behavior with other UUVs, via underwater acoustic communications, and capabilities for launch and return to an underwater docking station.

TAR Crawlers, operated by Naval Surface Warfare Center (NSWC) Panama City, demonstrated capabilities to reacquire and identify mine-like objects in very shallow water and surf zone environments, with re-direction by a cooperating REMUS mine-detection UUV via underwater acoustic communications.

The Hydrographic Unmanned Survey Craft (HUSCy) USV, operated by the Naval Oceanographic Office, demonstrated capabilities for tactical data collection for shallow water hydrography / oceanography and also remote launch of a small Ranger RN-2 UUV, a demonstration conceived during AUV Fest 2005 by the two vehicle teams in the collaborative environment fostered by the National UUV T&E Center concept.

Slocum Gliders, operated by Alaska Native Technologies in cooperation with the Space and Naval Warfare Systems Command (SPAWAR), demonstrated persistent UUV operations for mapping of ambient underwater noise conditions and collection of sound speed data, with transmission to shore for comparison with NUTEC's "ground truth" data. The Slocum gliders also demonstrated rendezvous and station-keeping with a Seaglider UUV operated by the University of Washington's Applied Physics Laboratory.

sion. SDVT-1 effectively trained with assets from Newport, R.I., Keyport, and Hawaii - without leaving Hawaii. Speaking at the NDIA UMV T&E Conference, COL William Schopfel (USMC, Ret.), ONR Research Test Director, said the event has grown considerably over the last few years. "The initial AUV Fests normally commandeered about ten systems and technologies and the total numbers of participants and visitors rounded out to about 150. This one was a wee bit different. There were 18 organizations involved. Forty technologies [vehicle and in-water systems], not ten…and we spread them out over the seven range areas at Keyport-often having 12 or 13 different systems and technologies in the water simultaneously." There were more than 450 visitors to the combined AUV Fest 2005 and NDIA Conference events from academia, industry, and Department of Defense with 40 unmanned vehicles and technologies tested by 18 organizations. "Navy labs must work even more closely with developers in industry and academia, who themselves have come to focus more closely on T&E," said Dr. Paul Lefebvre, NWCK T&E Executive and product area director for Undersea Warfare Analysis and Assessment, during his opening remarks at the NDIA Conference.

"Unmanned undersea vehicles have historically con-

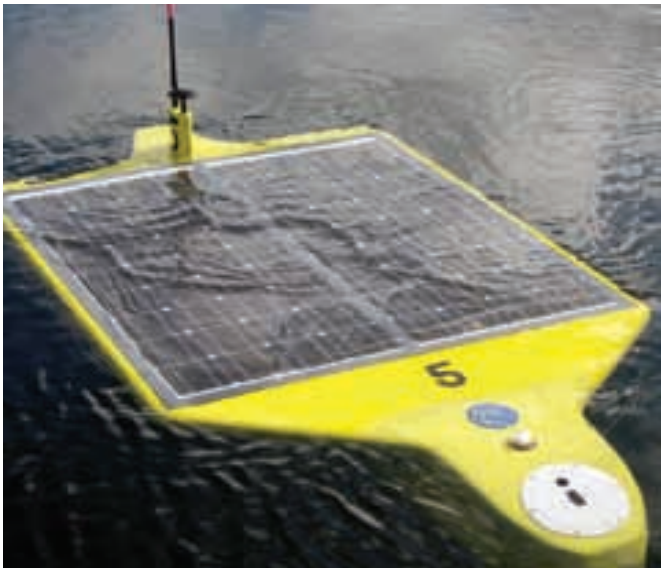
ducted experiments with the Navy fleet and increasingly, we will see T&E become more integrated with the fleet through the Sea Trial process as well as becoming fully integrated through all phases of development."

From a NAVSEA perspective, in today's forward-deployed scenarios, technologies are needed that bring realism to training without the logistic costs of moving people and resources - and technologies are needed that leverage T&E events into training opportunities. AUV Fest showed that steps are being taken to make that vision a reality.

AUV Fest 2005 is the second such event held at Keyport, home of one of the Navy's few cold-water undersea test ranges. Established in 2001, NUTEC builds on more than 90 years of undersea systems test and evaluation experience to test new unmanned undersea platforms and aid in their transition to practical Fleet use.

(The preceding report was supplied from a compilation of reports from NAVSEA Warfare Center Keyport Public Affairs; by JO2 David G. Schmidt, U.S. Navy Reserve Journalist, Commander Destroyer Squadron Two, Detachment B, Naval Marine, Corps Reserve Center, Harrisburg, PA; and by JO1(SW) Michael S. Howlett, COMSUBGRU9 Public Affairs)

The Mid-sized Autonomous Research Vehicle (MARV), developed by Naval Undersea Warfare Center (NUWC) Division Newport, demonstrated underwater color video survey capabilities, high-accuracy inertial navigation, and interoperability with Solar AUVs (SAUVs) using acoustic communications.



Solar AUVs (SAUVs), operated by the Autonomous Undersea Systems Institute (AUSI), in collaboration with NUWC Division Newport, Technology Systems, Inc., and Benthos, Inc., demonstrated capabilities for persistent surveillance by conducting multiple-vehicle cooperative operations using a "mother ship" navigation concept, with the vehicles taking turns operating while other UUVs surfaced to recharge their batteries via their solar panels.

A Hydroid vehicle put to the test.

Marine Science & Tech in New England

By Maggie L. Merrill

A long-awaited study of the economic impact of the marine science and technology industry in Massachusetts and the entire northeast region was completed in March of this year. The seven-month study was the brain-child of the Marine and Oceanographic Technology Network, a trade association comprised of 70 firms, universities, and government agencies in the field of ocean science. They formed a business network in 1993 with funding from the Massachusetts Office of Business Development. Over the years it became increasingly difficult to get the attention of state business leaders because other business clusters (such as medical devices and biotech) were better at defining themselves and proving their worth to the state.

Those in the business have known for a long time that they have a positive economic impact worth bolstering. But, typical of small businesses, most did not have the time to convince the powers that be of this fact. Most of these firms were started by leading engineers or scientists from a host of institutions in the area, including WHOI, URI, UCONN, and MIT. Their products and services are sold to university and government researchers, offshore oil and gas companies and the U.S. Navy.

Now, with the region needing to kick-start the economy, the time is right to finally define in economic terms the importance of this industry to the state and region.

The University of Massachusetts think tank The Donahue Institute, along with researchers from UMASS Dartmouth and Boston, coordinated the study; entitled

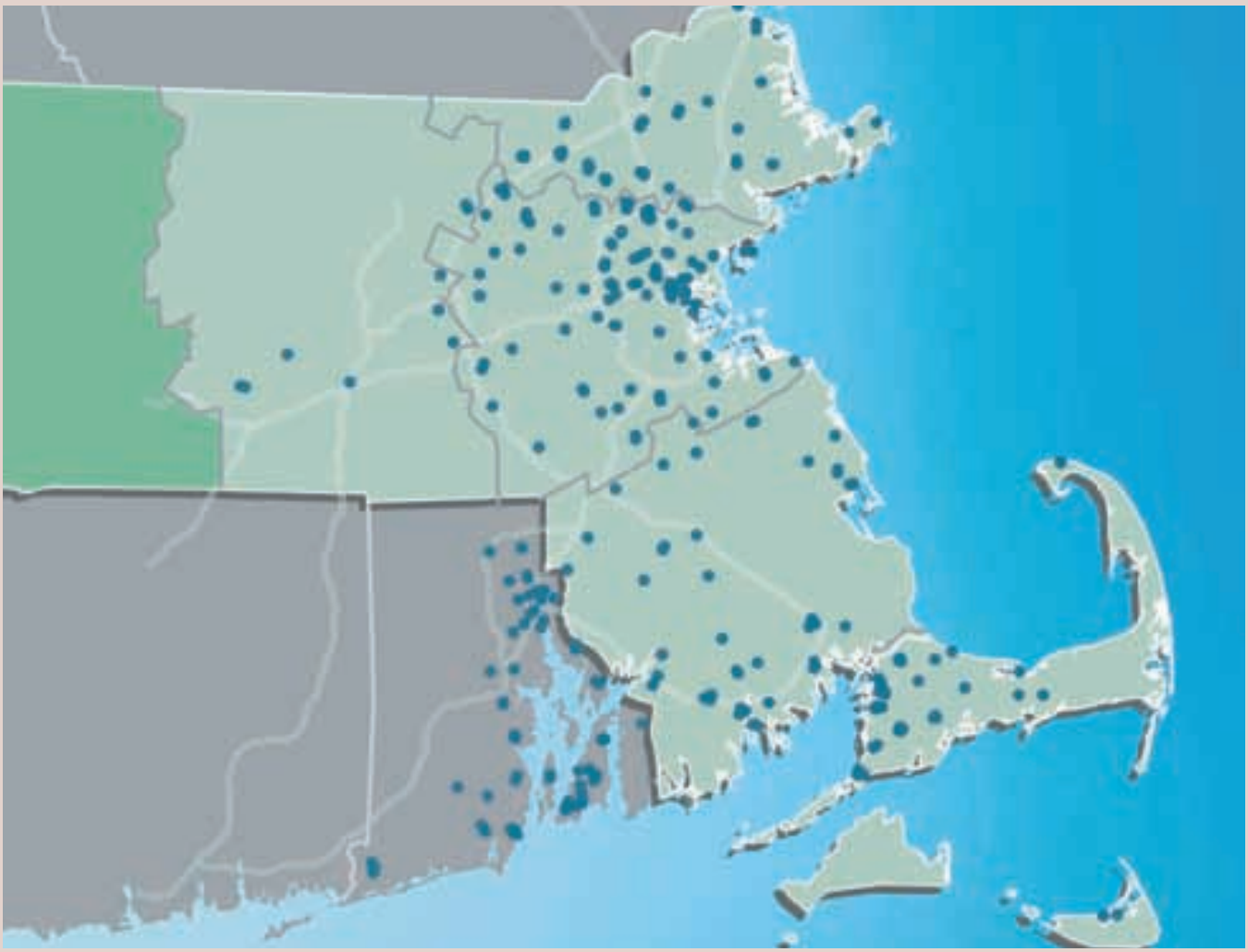
The Marine Science and Technology Industry in New England. The prime objective of the study was to develop awareness of the size and impact of this industry in Massachusetts and the New England region. This study has laid a strong foundation for much more work to come.

Clyde Barrow, Director of UMass Dartmouth Center for Policy Analysis, led the study team. "This is the one of the best industry analyses that I have ever completed. Because of the funding and the collaboration with industry, we were able to take the time to create an industry database from the bottom up. We were able to combine a variety of databases to build a true profile of the industry."

The study has enabled the business research community to begin to describe the many facets of the sector. According to one of the three authors, The Donahue Institute's Rebecca Loveland, "From a business research point of view there was not a lot of literature on the marine science and technology industry per se. There was little to no quantitative data available on this very specialized industry. To make matters more challenging, the equipment produced by companies in this industry could not be found directly in any regular business database."

The Results

The report states that in 2004, 481 firms in the marine science and technology cluster directly employed more than 39,000 people in New England and produced annual sales worth over $4.8 billion. (For the record,



Distribution of Marine Science and Technology Establishments, Eastern Massachusetts and Rhode Island.

Massachusetts houses 298 firms; Rhode Island has 74; New Hampshire has 29; Connecticut has 61; and Maine boasts 19 firms.)

Most of the firms studied operate in international markets; expect growth in terms of employment and sales and all stated that they do not want to move to another region of the country due to the benefits of being located near so many sources of skilled workers; to universities with whom to partner on new product development; and to all the cultural and economic benefits of being in the northeastern part of the country.

The companies in this sector produce niche related products such as: current meters, tide gauges, underwater data loggers, remotely operated imaging systems, underwater vehicles, sonar systems, buoys, navigation equipment and communications gear. In addition, the sector includes numerous engineering, field, service and consulting firms.

Establishments Providing Marine Science and Technology Products and Services, 2004

	Establishments	Employment	Sales ($m)
Massachusetts	298	18,152	3,330.6
Maine	19	10,909	883.5
Connecticut	61	10,831	1,169.1
Rhode Island	74	9,301	1,335.3
New Hampshire	29	6,754	1,079.3
New England	481	55,947	7,797.8

*Data in this table represent employment and sales for all companies providing marine-related products and services, regardless of their level of involvement. Source: THE MARINE SCIENCE AND TECHNOLOGY INDUSTRY IN NEW ENGLAND REPORT: D&B MarketPlace; author's survey

The study also pointed to some of the more obvious areas for growth; specifically homeland security, large scale

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Company Profile

Mooring Systems

Mooring Systems, Inc. is located in Cataumet, Massachusetts along route 28A where many marine technology firms have established themselves to provide products and services to the Woods Hole Oceanographic Institution, Marine Biological Lab, U.S. Geological Survey and National Marine Fisheries Service.

Mooring Systems was founded in the 1980s to provide oceanographic scientists and engineers with design services, fabrication, and a supply of ocean moorings, instrumentation platforms and surface buoys. Mooring Systems employs a staff of six who have many years of experience working with the Woods Hole Oceanographic Institution's mooring design group. They have extensive background in the analysis of moored systems along with computer modeling tools to design custom systems. Mooring System's 5,000 square foot manufacturing space houses a complete welding and machining center, a rigging shop, and other capabilities to provide turn key moorings for clients all over the globe. Mooring Systems supplies instrument frames and surface buoys to a large number of instrumentation manufacturers on an OEM basis. Recently, Mooring Systems purchased the rights to a complete coring product line from Benthos, Inc. which will fit nicely into their work with scientists who are conducting all sorts of sediment and bottom sampling research. www.mooringsystems.com

Surface Buoys aboard the Oceanus

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ocean science, and energy from the ocean.

Homeland security is a new market bringing new business, albeit slowly, to many in the region in the form of orders for a variety of above water and underwater intruder surveillance, survey and alarm systems.

Large-scale ocean science is back in force now that there are more satellites flying and better power sources for long term ocean instrument deployments. One of the largest federal initiatives, The Ocean Observatories Initiative of the National Science Foundation, has the potential to pump millions into the New England economy. The objective of the program is to "wire" the ocean for weather, research, energy, food and protection.

Finally, the concept of extracting energy from the ocean in the form of offshore wind farms, tidal energy, and ocean thermal energy conversion are being revisited as part of renewable energy sources worth supporting with federal and state tax incentives. All totaled these new markets are worth hundreds of millions to manufacturers of high technology service and equipment for the ocean. New England firms are well positioned to take advantage of these emerging markets.

State Support for Industry is Key

The Massachusetts Executive Office of Economic Development (EED) was created in 2003 by Governor Mitt Romney to foster economic growth in the Commonwealth. EED Secretary Ranch Kimball stated

that he and Governor Mitt Romney are "pleasantly surprised at the depth and breadth of the marine science and technology sector." The state wants to grow the marine technology cluster to drive economic growth and add jobs.

According to the study, there is a high concentration of firms dependent on the marine sector located on Cape Cod, along the Route 195 corridor and reaching into Rhode Island as well. Also, there is a cluster of firms located in Newport, RI in close proximity to the US Naval Underwater Warfare Center and URI. Therefore, the EED is focusing its resources in the SE part of the state. They will convene a marine science and technology summit this fall to ask business and university leaders to define specific action items for the state to address the improvement of the business environment.

Paul Vigeant, Director of the South Coast Development Partnership, an economic development arm of UMass Dartmouth located in the southeastern part of the state, provided $40,000 of the total price tag of $80,000 for the study. "We are taking a very long and steady view of this emerging industry," said Vigeant. UMASS Dartmouth's Advanced Technology Manufacturing Center (ATMC), director, Tom Curry says, "we expect that the results of this study will lead to further recognition and support for the myriad of relatively small companies involved. The Massachusetts marine science and technology industry is impressive when you look at it in a collective way."

To promote a close working relationship with southeast-

Company Profile

Hydroid

Hydroid, Inc. was founded following the execution of a technology transfer license with the Woods Hole Oceanographic Institution (WHOI). The intent of the license was to transfer the REMUS Autonomous Underwater Vehicle (AUV) technology out of the academic development environment and into the commercial marketplace, making the technology available to a wide array of users. Since spinning out of the Oceanographic Systems Laboratory (OSL) at Woods Hole, Hydroid has sold over 100 REMUS vehicles that are now in operation around the world, serving customers within the military, scientific, and commercial markets. Hydroid operates from a state of the art, 7,600 square foot manufacturing facility located in an industrial park in Pocasset, Mass.; a ten minute ride to the village of Woods Hole. They currently have a staff of 15 and are in hiring mode. Hydroid plans on introducing a family of AUVs during 2006 that will have various sensor suites, payload capacities, and extended mission durations. The new family of AUVs will cover depths to 6,000m. Hydroid anticipates significant business growth in 2006 and 2007 as AUV technology continues to gain acceptance in numerous markets.

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Marine Sector Sales ($m) by State and New England Region, 2004

	Marine Instrumentation & Equipment	Marine Materials & Supplies	Marine Research & Education	Marine Services	Shipbuilding & Design	Total
Massachusetts	668.6	112.2	6.6	753.5	N/A	1,540.8
Rhode Island	786.5	182.3	0.1	35.1	7.2	1,011.3
Connecticut	72	86.2	0.1	42.6	744.5	945.4
Maine	2.8	19.8	N/A	0.7	844.8	868.1
New Hampshire	436.4	56.8	N/A	10.1	N/A	503.3
New England	1966.3	457.3	6.8	842.1	1596.5	4,868.9

Source: THE MARINE SCIENCE AND TECHNOLOGY INDUSTRY IN NEW ENGLAND REPORT: D&B MarketPlace. * Note - Although sales for marine research and education are reported here for three states, these commercial data do not capture grant and contract activity, thus actual revenues in this sector are significantly underreported.

Company Profile

Brooke Ocean Technology-USA

Brooke Ocean Technology-USA or BOT-USA is incorporated in the United States and is affiliated with Brook Ocean Technology, a well known oceanographic firm based in Dartmouth, Nova Scotia. BOT-USA is the first tenant at the Quest Center in New Bedford, Massachusetts.

BOT-USA is a team of engineers and designers who design, fabricate, build, test, and market rugged gear for the oceanographic community. They specialize in launch and recovery systems for Autonomous Underwater Vehicles (AUV) and handling systems for towed instruments.

This winter, BOT-USA partnered with BlueFin Robotics of Cambridge, Mass. to win Phase 1 and Phase 2 Small Business Innovation Research grants (SBIR) to design and build a prototype launch and recovery system for the Bluefin-12 AUV. The $2 million contract was awarded in mid-August. The task is to design, manufacture, and test an automatic launch and retrieval system for a variety of underwater vehicles. Roger Race, General Manager of BOT-USA stated, "We are all very pleased with this award and we are really looking forward to delivering it well within the 18 month time frame.

"The future is looking very bright for BOT-USA, We plan to grow the business and hire more designers and electrical engineers. We will be exhibiting at Oceans 2005 in September." www.brooke-ocean.com

ern Massachusetts businesses, UMass Dartmouth set up two business start-up incubators:

The Advanced Technology Manufacturing Center located in Fall River and the Quest Center located in New Bedford.

Both sites provide start-up companies with reasonably priced work space, shared administrative services, and access to innovative technologies and intellectual property associated with UMASS.

It seems that finally, the marine technology business sector is in the process of being defined in business and economic terms.

Now it's up to the extremely innovative people in the industry to take advantage all that the future holds.

Marine Instrumentation and Equipment, 2004

Subsectors	Employment	Sales ($m)	Establishments
Electronics for marine instruments and platforms	7,621	1,143.5	68
Electronics for marine navigation and communications	3,058	524.8	31
Oceanographic and geophysical measuring instruments	962	151.6	28
Acoustics	442	31	23
Floatation equipment	152	19.8	6
Underwater construction equipment	130	70.9	9
Underwater vehicles	118	22.2	5
Diving and underwater work equipment	11	2.2	2
Underwater telecommunications systems	N/A	0.1	2
Remediation equipment	N/A	N/A	1
Total	**12,496**	**1,996.3**	**175**

Source: THE MARINE SCIENCE AND TECHNOLOGY INDUSTRY IN NEW ENGLAND REPORT: D&B MarketPlace; authors' survey.

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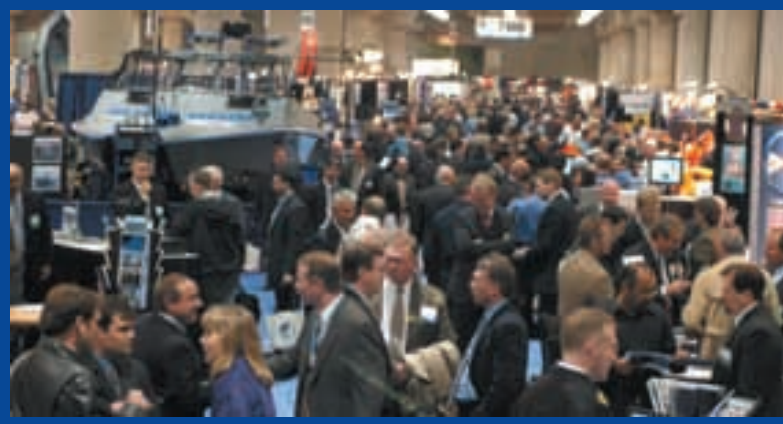

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Assessing the Risk in
U.S. Ports

By LCDR Bess Griffith, LCDR Brady Downs, Mr. Bob Reimann, Chris Doane and Joe DiRenzo III

Since the attacks of 9/11, strategists, academics and pundits alike have debated many aspects of maritime security, including the fundamental question of "assessments." Key questions (such as "How do you truly assess a port and its vulnerabilities?", or "How can risk and vulnerability be used when looking at critical infrastructure?") are routinely posed.

The Coast Guard, along with state and local authorities, has taken an active role in addressing the question of assessment within the maritime transportation system and the many factors involved in this critical issue.

As one of its initial actions, the U. S. Coast Guard created the Port Security Directorate to manage a program to enhance security in our nation's seaports. A crucial part of this organization is the Port Security Assessment Team at Coast Guard Headquarters, which has the responsibility of maintaining an understanding of port vulnerabilities and potential consequences of maritime-related terrorist acts. Additionally, they implement tools to help ports reduce the risk of terrorism.

The directorate immediately made an impact by conducting Port Security Assessments (PSAs) in the nation's militarily and economically strategic ports; chartering studies of the consequences of terrorist acts on specific types of vessels and infrastructure; managing a risk-based tool to help ports identify and reduce their risk of terrorism; and assisting the Department of Homeland Security in administering grants to improve port security.

Speaking before the U.S. House of Representatives Subcommittee on Coast Guard and Maritime Transportation, then-Coast Guard Chief of Port Security, Rear Admiral Larry Hereth (who is now the Fifth Coast Guard District Commander), discussed the importance of the PSAs, stating that the "assessments will augment those port security risk assessments conducted at the local port and facility level and will continue to enhance the level of preparedness outlined in our Area Maritime Security Plans."

The link made by the Admiral between the PSAs and the Area Maritime Security Plans, which are a key part of

Petty Officer 3rd Class Andrew Widell from MSST 91103 performs tests on the new IAS system. (See related story on page 37)

Photo credit: Petty Officer 3rd Class Nathan Henise, PADET San Pedro

the Maritime Transportation Security Act (MTSA), is a critical facet of security. The assessments help drive and develop the plans.

So what exactly is the Port Security Assessment Program?

This program takes a very close look at the vulnerabilities of critical infrastructure and key assets in a port supporting the marine transportation system. The assessment approach is unique in that it looks at port infrastructure from the perspective of the terrorist; applying Coast Guard-led teams of former U.S. Navy Seals to identify potential targets within the port, including bridges, waterways and terminals. These teams focus on the vulnerabilities of these targets and develop scenarios for attacking them, then follow up with recommendations to improve security and to detect, deter and disrupt potential attacks.

To raise security awareness within the port, the assessment identifies locations where terrorists might conduct surveillance of targets, gain access to the target, stage equipment near the target, and outline activities which may indicate that security is being probed prior to an attack. Using the unique terrorist operations perspective enhances the vulnerability assessments required by the Maritime Transportation Safety Act (MTSA) and prevents duplicating the security assessments being widely conducted by industry and government agencies. Assessments have been conducted over the past three years in 61 of the nation's most strategic port systems.

But what exactly is considered "risk" in an assessment? The Coast Guard defines risk as being equal to consequence times vulnerability times threat. It is essential that the evaluator have a good understanding of all three elements to effectively mitigate the terrorist threat.

Besides the vulnerability assessments themselves, another key issue within each port is the assessment of risk. Considering the uncertain nature of security threats and the limited resources to counter them, it is very important to apply risk analysis to tackle the greatest vulnerabilities with the worst consequences. The Coast Guard has used a tool called the Port Security Risk Assessment Tool (PSRAT) for the past four years to assess risk in the various ports across the nation in order to provide local stakeholders with the information they need to best apply their limited resources.

Currently, the Coast Guard Port Security Assessment Team is in the process of creating the next generation of this tool, called the Maritime Security Risk Assessment Model (MSRAM), which substantially improves the detail of the present model and gives a more accurate prioritization of risk in the port based on past experiences and lessons learned by headquarters and field units.

The new model incorporates the following improvements:

- An improved threat component by applying threat data from the Coast Guard's Intelligence Coordination Center;
- Realigned or pre-mapped asset categories to provide easier reporting and comparison of results;
- Revised attack scenarios and alignment with other Coast Guard programs and Department of Homeland Security efforts;
- Improved consistency of consequence and vulnerability scores between ports by having subject matter experts assign acceptable ranges of scores. Field personnel will be able to override these assignments with appropriate justification;
- An asset screening step that will allow users to determine if the consequence ratings rank high enough to require a more detailed review of the most critical assets in the port;
- A "what if" capability where mitigation strategies can be applied to the scenario/asset combination to evaluate the resulting risk reduction;
- Training for field units with the deployment of the tool; and
- Analysis of data to support command and national risk-based decision making.

In addition to the vulnerability assessments and the analysis developed via the PSRAT, the Port Security Assessment Team conducts special assessments to gather information on vulnerabilities and to determine the possible consequences of terrorist attacks on various vessel types and other critical port infrastructure. These assessments assist all levels of the Coast Guard, especially the Captain of the Port (COTP), in their role as the Federal Maritime Security Coordinators (FMSCs) in making risk-based policy decisions based on factual data.

What are special assessments?

Special assessments typically include a technical review of the vessel or port infrastructure, mission, location, known vulnerabilities, cargo, areas of transit, terrorist modes of attack and historical review of related incidents. Technical experts then use computer models to determine blast effects of various explosions for a range of attack scenarios providing a consequence assessment. The information gained by these assessments helps us better under-

(Continued on page 40)

Mission Detection: The Underwater Port Security System

The Coast Guard's newest wave of anti-terrorism tool is being unleashed on ports nationwide. The Underwater Port Security System (UPSS) can detect, track, classify and interdict intruders, and allows for the inspection of hulls and pier structures or anything that is underwater.

"Terrorists are always looking for ways to attack elements of our infrastructure critical to our economy and our freedom," said Coast Guard Pacific Area Commander, Vice Adm. Harvey Johnson during a recent demonstration of the system in San Pedro, Calif. "Our ports are absolutely vital to this nation, and we are constantly looking for ways to improve our ability to protect them."

The UPSS is composed of two elements: the Underwater Inspection System and the Integrated Anti-Swimmer System.

The Underwater Inspection System uses divers trained to conduct ocean-bottom searches and inspect ships' hulls and piers. It includes Remotely Operated Vehicles that can be deployed underwater when it may be too dangerous to put a diver in the water, as well.

Members of MSST 91103 perform a demonstration of the new IAS system Oct. 21, 2004. The system was officially unveiled on Feb. 2, 2005.

Photo credit: Petty Officer 3rd Class Nathan Henise, PADET San Pedro

"The Coast Guard has been lacking in this area for awhile," said Petty Officer 2nd Class Jachob Smith, an electronics technician assigned to the Maritime Safety and Security Team in San Pedro. "Before we had this system, it was all about crews standing at lookout watches. We were really limited as to what we could see. Now, we can see very well in even cloudy or murky water."

The second element of the UPSS is the Integrated Anti-Swimmer system. The IAS is comprised of a commercially available sound head that detects and tracks potential underwater threats, and a processor that classifies underwater contacts and alerts system operators to their presence. IAS is capable of guiding Coast Guard security forces to the threat, and provides high frequency sonar images to positively identify the contact as a swimmer or diver, and not marine life or some other object. Smith said MSST divers have been sent underwater to try to trick the system and to test its detection parameters, and, so far, the system has proved infallible.

"We've had the divers go at the system at all speeds and from all angles, and it detects them every time," he said.

The system, which will be housed with certain Maritime Safety and Security Teams throughout the country, is portable and is available for operational commanders for specific events, either as a deterrent or in response to intelligence reports.

When the system is deployed, the Coast Guard will notify the public that specific security zones have been put in place. Should someone innocently enter a security zone, the Coast Guard will make reasonable efforts to communicate to them using underwater loud hailers before using any additional forcible measures.

Smith, who's been working with the system for about a year and half, said he underwent extensive training to become well-versed in the system's operations. He said knowledge of wireless networking technology, as well as general computer knowledge, is necessary to become proficient at the system.

"There is a significant learning curve, but it is doable," Smith said. "It just takes time."

Concern over the effect this system might have on marine life led the Coast Guard to consult with the National Marine Fisheries Service. Preliminary data indicates that the system will not have a significant impact on any marine species, and the Coast Guard will continue to work with NMFS to ensure the environmental impact is as minimal as possible.

"This system adds a layer of security to our ports by providing specific protection from underwater threats, and it reduces the chances of success for a possible means of attack," said Johnson. "It is by no means a guarantee, but it is an important step forward."

— By Petty Officer 1st Class Amy Thomas, Pacific Area Public Affairs

Deep Sea Systems Wins Port Security Contract

Deep Sea Systems International (DSSI) of Cataumet, Mass., recently delivered an advanced, zero visibility port security ROV vehicle.

The contract awarded from the University of South Florida (USF) specified a port security ROV system for use in ship hull inspections including port and harbor surveys in absolute zero visibility conditions. DSSI was selected by USF to perform the vehicle design and manufacturing services and to integrate an array of advanced sensors provided by USF. DSSI's Sea Max Mk-2 Port Security ROV System included a vehicle with the sensors and equipment required for precise maneuvering and accurate positioning using high resolution sonar and video imaging, enabling the vehicle to precisely bottom map and survey in real-time. The sensors installed on the vehicle are to enable it to handle the inspection of ship hulls, piers, harbors, ports, pipelines, and moorings in all visibility conditions including "black water." The system enables the piloting of the vehicle virtually as easy as when using traditional video systems in clear, open water. All the while being able to control the vehicle in the most turbid waters, with over 300 lbs of thrust. The vehicle carries an array of under water sonar systems, including a Didson sonar, Coda Echoscope (real time 3-D imaging), Ring Laser Gyro, an inertial navigation system, an acoustic Doppler navigation system, and a viewing system composed of four color TV cameras. It also has quartz halogen and HID lights, an image scaling system, and a heavy duty tilt unit with a precision angular position feedback sensor. In addition, the data processing and collection capability of the system will enable route surveys to be routinely performed by building a sonar database of the survey and object identification data as references for comparison with data from subsequent surveys enabling the operator to notice any changes or anomalies. Vehicle control and data acquisition is accomplished over a high speed multiple user Fiber Optic data link including an option for a wireless link to shore.

The Sea Max Mk-2 vehicle is based on the larger, all-electric, highly maneuverable Omni Max vehicle currently in service.

Propulsion is provided by six of DSSI's acoustically and electromagnetically quiet 2-hp TH-2100 thrusters mounted in an omni directional configuration for smooth, precise lateral and vertical control of vehicle motion. The company currently supplies both commercial and military applications including delivering sophisticated ROV systems, cameras, lights, thrusters and other highly advanced custom products.

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Remote Minehunting System Approved

Assistant Secretary of the Navy for Research, Development and Acquisition John J. Young, Jr., approved for production the AN/WLD-1 Remote Minehunting System (RMS). RMS is a next-generation organic mine countermeasure system being developed by the Program Executive Office for Littoral and Mine Warfare (PEO LMW).

"Under the leadership of Secretary Young, the Chief of Naval Operations, and in close partnership with the Fleet, the Naval Sea Systems Command Warfare Centers and our industry partners, we are now in a position to deliver real capability to the war fighters," said Rear Adm. William E. Landay, III, program executive officer for LMW. "The approval of RMS for production is another success story in our ongoing effort to claim ownership of the littoral. RMS and the other systems we are acquiring will help assure access for U.S. and joint forces. As the CNO has noted, our naval and military success depends upon access, speed and persistence."

Recent at-sea system qualification testing, witnessed by Commander, Operational Test Force personnel demonstrated acceptable RMS performance to warrant the low-rate production decision. PEO LMW's Mine Warfare Program Office (PMS-495) is extremely pleased with the RMS's capability and demonstrated performance, according to Gary Humes, program manager."During at-sea testing, the system met or exceeded all its critical performance parameters and demonstrated the ability to provide a significant operational advantage to our current minehunting capability," said Humes.

Operating from DDG 51-class Flight IIA destroyers and the new Littoral Combat Ship, the RMS will provide continuous, unmanned, over-the-horizon capability to determine the presence or absence of mines. The RMS uses a diesel powered semi-submersible vehicle, 23 feet (7 m) long, four feet (1.2 m) diameter, and weighing 13,000 pounds towing an AN/AQS-20A sonar mine detecting set to detect, classify, and localize volume, tethered, close-tethered, and bottom mines for Strike Group avoidance or organic mine clearance. The system also has the capability to properly identify close-tethered and bottom mines using an electro-optical ID system.

Lockheed Martin, Maritime Systems & Sensors, Undersea Systems in Syracuse, NY, is the prime contractor for the RMS program. Under the fixed price incentive contract for low rate initial production, Lockheed Martin will produce three vehicles in fiscal year (FY) 2005. The Navy plans to acquire a total of 47 RMS systems between FY 2005 and FY 2011.

Recently, PMS-495 and PEO LMW successfully guided two other systems through low rate initial production decisions. The AN/AQS-20A sonar mine detecting set and the AN/AES-1 Airborne Laser Mine Detection Systems were also approved for production in April and May, respectively. Both of these systems are to be operated from the MH-60S helicopter.

Kongsberg Wins $2.1M Contract

Kongsberg Underwater Technology won a $2.1 million contract for the upgrade and maintenance of the U.S. Navy's existing Kongsberg SM 2000 Underwater Surveillance Systems. The contract is with the Space and Naval Warfare Systems Center, San Diego and provides for the ongoing maintenance and upgrade of existing systems over the next five years. It follows a $3 million order in May 2005 for the delivery of an additional 10 SM 2000 systems for the US Coast Guard's Integrated Anti-swimmer System (IAS). The SM 2000 Underwater Surveillance System is manufactured by Kongsberg Mesotech Ltd., Port Coquitlam, British Columbia, Canada. The system is designed to track and process underwater threats in order to provide alarms for operators to act on. The system uses Sonar to detect and differentiate between divers and other targets such as marine life and debris.

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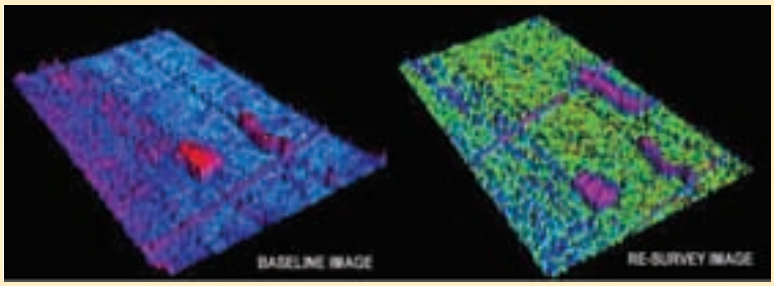
Triton Selected for Port Security System

NOAA purchased Triton Imaging's HarborSuite multibeam and sidescan sonar acquisition and QC system for use in an underwater port security application. The system was purchased by NOAA's Navigational Response Team (NRT) which is a component within the Office of Coast Survey. The system will be used to test the Baseline Port Security (BPS) concept being developed by the U.S. Coast Guard R&D Center. With BPS, high-resolution sonar images of high-risk areas of the port seabed are periodically collected. The resultant images are compared with a set of baseline images. Changes are detected and suspicious objects are then investigated with divers and/or remotely operated vehicles (ROVs).



In this application, Triton's Isis Sonar software will control Reson 8125 multibeam and Klein 5000 sidescan sonars. Triton's MosaicRT and BathyRT software will provide real-time geo-coded images of the seabed and associated bathymetry to insure complete and accurate coverage of the seabed. Also included in the purchase is Triton's survey monitor software, Triton MB-Monitor. MB-Monitor analyzes multibeam data quality in real-time and provides visual feedback to the vessel operator to ensure high-quality data is being collected and insuring that no potentially dangerous objects will be overlooked.

Triton personnel are installing the HarborSuite system on the SeaArk vessel this summer, with on-the-water testing scheduled in August in Miami Harbor.

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(Continued from page 36)

stand what may happen during a terrorist attack so that the most appropriate measures may be implemented to protect our ports and waterways.

Special technical assessment projects are nominated by Coast Guard Headquarters and its Areas, Districts, Sectors and field units. Examples of special technical assessments conducted include blast and consequence analysis of:

- Liquefied Petroleum Gas (LPG)
- Passenger Ferries;
- Barges carrying Certain Dangerous Cargoes (CDCs);
- Tunnels;
- Liquefied Petroleum Gas (LPG) barges
- Cruise ships

These assessments are classified because of the sensitive information that they contain, so they are not available to the general public.

A logical outgrowth of an assessment is a need to address the vulnerability and gaps that have been documented. One of the mechanisms currently in place to address needs is the Port Security Grant Program.

When vulnerabilities are identified, consequences are known, and risks are prioritized, it is important to take steps to reduce risk in the port. This takes resources. To help, the federal government administers a Port Security Grant program that funds projects which reduce security risks in ports. The Coast Guard plays a significant role in the grant process, which has awarded over $560 million since 9/11. In 2004, the DHS Office of State and Local Government Coordination and Preparedness (SLGCP) was designated as the lead agency to centralize state and local terrorism preparedness and grant administration with other emergency preparedness grant programs. The program has received good feedback because it addresses issues "at the deck plate" level.

The Port Security Assessment Program, the PSRAT (soon to be MSRAM), special assessments and the Port Security Grant program combine to provide an in-depth understanding of risks in our ports. The Maritime Transportation System and the American public expect nothing less as we fully exploit effective mitigation strategies.

OCEANS 2005

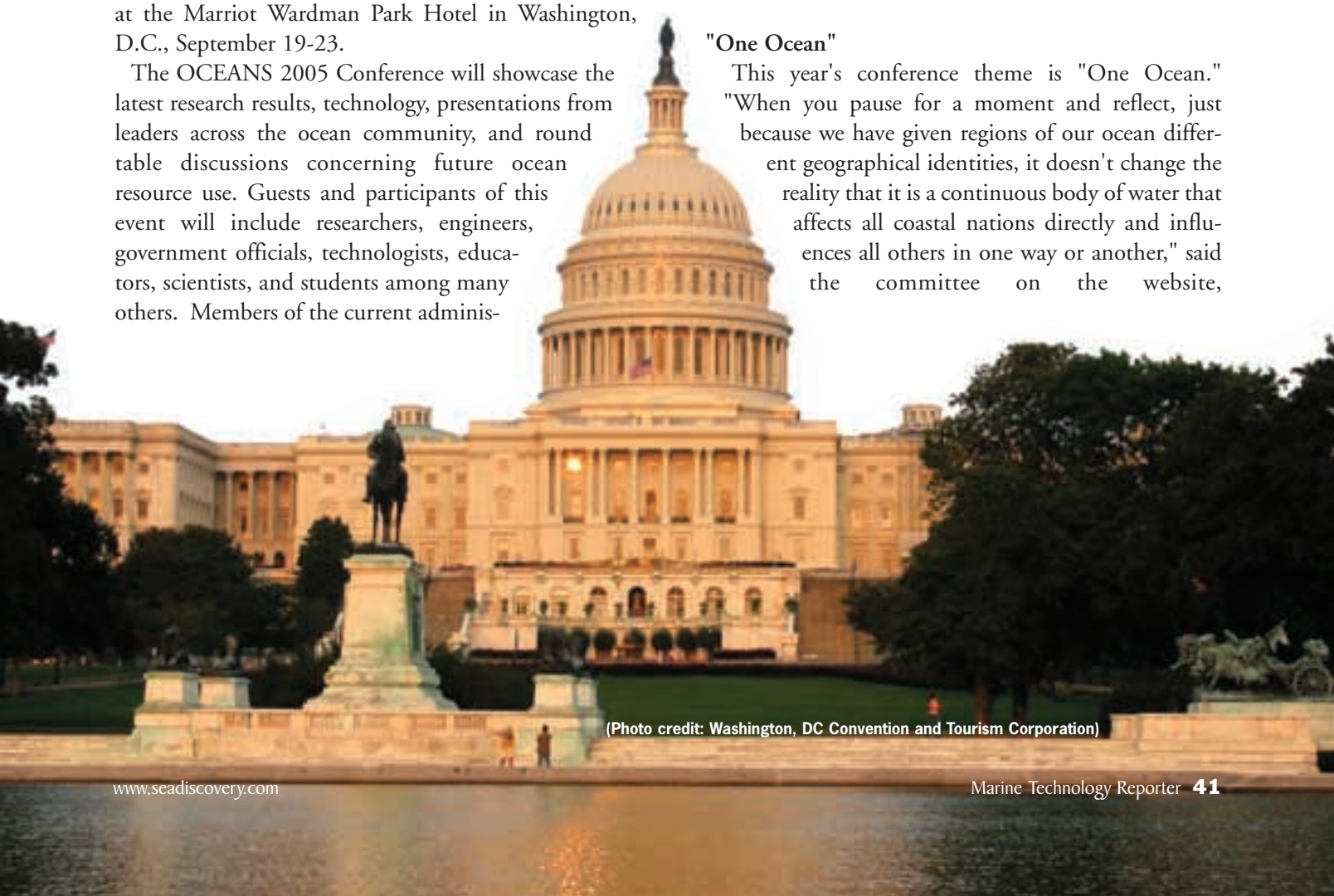
September 19-23, Washington, D.C.

The nation's capital will host the OCEANS 2005 Conference, one of the largest international forums devoted to ocean sciences, technology, policy, engineering and education. The conference, presented bi-annually by the Marine Technology Society (MTS) and the Institute of Electrical and Electronics Engineers (IEEE), will be held at the Marriot Wardman Park Hotel in Washington, D.C., September 19-23.

The OCEANS 2005 Conference will showcase the latest research results, technology, presentations from leaders across the ocean community, and round table discussions concerning future ocean resource use. Guests and participants of this event will include researchers, engineers, government officials, technologists, educators, scientists, and students among many others. Members of the current administration- including the president and the vice president- have been invited to attend. The Conference Committee aims to bring attention to recent commission reports for future national ocean policies and create public awareness regarding the condition and maintenance of our "one ocean."

"One Ocean"

This year's conference theme is "One Ocean." "When you pause for a moment and reflect, just because we have given regions of our ocean different geographical identities, it doesn't change the reality that it is a continuous body of water that affects all coastal nations directly and influences all others in one way or another," said the committee on the website,



(Photo credit: Washington, DC Convention and Tourism Corporation)

www.oceans2005.org. "The future of our 'One Ocean' is vitally important to all of our global society, and we want to identify all of the great work that is going on already in the context of the much greater need for additional work and interaction that is necessary for the future of our 'One Ocean.'"

Under the "One Ocean" theme, issues such as Homeland Maritime Security, Global Observation and Exploration, Emerging Ocean Science, Technology, and Engineering, Ocean Education and Outreach and Proactive Global Cooperation and Engagement will be discussed.

Event planners expect guests to arrive in Washington, D.C. on Friday, September 16. On Sunday, September 18, there will be a conference registration in the afternoon and an Oceans Conference Film Festival later in the day. Program Focus Events will kick off on Monday, September 19, followed by an evening reception. Exhibitions, luncheons, and focus events will continue until Thursday, September 22, when the exhibition hall is scheduled to close. On Friday, September 23, there will be a Global Ocean Town Hall meeting, followed by the conference closing ceremony. For guests who are leaving early, organizers have planned a Potomac River cruise luncheon, while those leaving later that night will take part in the dinner river cruise aboard the Odyssey.

In the works

One of the goals that organizers have for OCEANS 2005 is to increase student involvement in the conference. Student will be invited to participate in a poster contest and, perhaps, even a student film contest. Organizers also hope to promote ocean education and outreach. Suggestions have been made by event committees as to how this goal can be achieved. Suggestions include: Have high school students and teachers attend; include a student conference in the program; and have college and job fairs within the conference.

(Photo credit: Washington, DC Convention and Tourism Corporation)

Washington, D.C.

According to the conference organizers, guests will have things to do besides attend conference events. They can tour the nation's capital on foot or by bike or boat. Avid readers can visit the Library of Congress, the largest library in the world. Sports fans can watch the national pastime, played by the city's home team, the Washington Nationals. Some may opt to see the Lincoln Memorial, centrally located near the Reflecting Pool, Washington Memorial, and the U.S. Capitol. There is also the Declaration of Independence in the National Archives as well as museums; such as the International Spy Museum, the Navy Museum, the National Geographic Museum and its interactive exhibits, the Smithsonian, and the Holocaust Memorial Museum.

For more information on OCEANS 2005 or to register, please visit www.oceans2005.org.

OCEANS 2005 Exhibitor List
September 19-23 - Washington, DC

Exhibitor	Website	Booth
Aanderaa Instruments	www.aanderaa.no	221-222
Alec Electronics Co. Ltd.	www.alec-electronics.co.jp	179
Alliance for Coastal Technologies (ACT)	www.act-us.info	109
Applied Signal Technology, Inc.	N/A	19
AXYS Technologies Inc.	www.axystechnologies.com	24
Benthos, Inc.	www.benthos.com	129-130
Birns Inc.	www.birns.com	152
Booz Allen Hamilton	www.bah.com	158-159
Brooke Ocean Technology Ltd.	www.brooke-ocean.com	4
CARIS	www.caris.com	114
Century Subsea, Inc.	www.century-subsea.com	162
CINTAL	www.ualg.pt/cintal/	14
Consortium for Oceanographic Research & Education	www.coreocean.org	41-42/76-77
D.G. O'Brien Inc.	www.dgo.com	143
Deep Development Corp.	www.deepdevelopmentcorp.com	67
DeepSea Power and Light	www.deepsea.com	160
DPS Technology	www.dpstechnology.com	91
EDO Electro-Ceramic Products	www.edocorp.com	92-93
Electrochem Commercial Power	www.electrochempower.com	163
Emerson & Cuming Composite Materials, Inc.	www.emerson.com	31
EnviroTech LLC	www.n-virotech.com	169
EurekAlert!	www.eurekalert.org/marinescience/	101
Falmat, Inc.	www.falmat.com	116
Falmouth Scientific, Inc.	www.falmouth.com	209
Flotation Technologies	www.flotec.com	120
Fugro Global Environmental & Ocean Sciences	www.geos.com	170
Fugro Pelagos, Inc.	www.fugro-pelagos.com	171
Future Oceans Conference Sites	N/A	11-12/16-17
General Dynamics Advanced Information Systems	www.gd-ais.com	190
GeoAcoustics, Inc.	www.geoacoustics.com	223-224
Geometrics	www.geometrics.com	229
Gilman Corporation	www.gilmancorp.com	73
Gold/Silver Sponsors & Co-Chairs (TBD)	N/A	56/75/176/184
Hafmynd GAVIA	www.Gavia-AUV.com	210
Harvey-Lynch, Inc.	www.harvey-lynch.com	111
Hawaii Dept. of Business, Economic Development & Tourism	N/A	175-181

OCEANS 2005 Exhibitor List
September 19-23 - Washington, DC

Exhibitor	Website	Booth
Human-Powered Submarine Display	N/A	20-21/26-27
Hydro Group plc	www.hydrohouse.co.uk	90
Hydro International/GITC bv	www.hydro-international.com	225
Hydroid Inc.	www.hydroidinc.com	25
Hydroscience Technologies, Inc.	www.seamux.com	39
IEEE Oceanic Engineering Society	www.oceanicengineering.com	13
Impulse Enterprise	www.impulse-ent.com	103
Intergovernmental Oceanographic Commission (IOC) of UNESCO	N/A	157
International Industries & L-3 Communications Klein Associates	www.internationalindustries.net www.L-3Klein.com	2
International Ocean Systems	www.intoceansys.co.uk	186
International Transducer Corp.	www.itc-transducers.com	138
InterOcean Systems, Inc.	www.interoceansystems.com	215
IVS 3D	www.ivs3d.com	115
IXSEA INC	www.ixsea.com	57-58/62-63
John S. Connor, Inc.	www.jsconnor.com	214
Khaled bin Sultan Living Oceans Foundation	www.livingoceansfoundation	74
Knudsen Engineering Limited	N/A	207
Kongsberg Maritime Inc.	www.kongsberg.com	8-Jul
LinkQuest Inc.	www.link-quest.com	172
Lockheed Martin Sippican, Inc.	www.sippican.com	53-61
MacArtney Offshore Inc.	www.macartney.com	127
Makai Ocean Engineering	www.makai.com	182
Marine Advanced Technology Education (MATE) Center	www.marinetech.org	97
Marine Magnetics Corp.	www.marinemagnetics.com	107
Marine Sonic Technology	www.marinesonic.com	34
Marine Technology Reporter	**www.seadiscovery.com**	**22-23**
Marine Technology Society	www.mtsociety.org	10
Materials Systems Inc.	www.matsysinc.com	30
McLane Research Laboratories, Inc.	www.mclanelabs.com	145
MCS	www.mcs.harris.com	187
Measurement Technology NW	www.mtnw-usa.com	123
METOCEAN Data Systems	www.metocean.com	87
Microcom Design, Inc.	www.microcomdesign.com	135
Minerals Management Service	www.mms.gov	192-193
Miros AS	www.miros.no	18
Mitretek Systems	www.mitretek.org	155-156
Mooring Systems, Inc.	www.mooringsystems.com	128
National Geospatial-Intelligence Agency (NGA)	www.nga.mil	69
National Response Center	www.nrc.uscg.mil	213
Naval Meteorology and Oceanography Command	pao.cnmoc.navy.mil	164-165
Naval Undersea Warfare Center - Division Newport	www.nuwc.navy.mil	98-99
Nekton Research, LLC	www.nektonresearch.com	68
NFESC	www.nfesc.navy.mil	136-137
NOAA	www.noaa.gov	139-150
NOBSKA/General Oceanics	www.nobska.net	230
NortekUSA	www.nortekusa.com	180
Ocean Marine Industries, Inc.	www.oceanmarineinc.com	178
Ocean.US	www.ocean.us	194
Oceaneering International, Inc.	www.oceaneering.com	46-47/51-52
Oceanic Imaging Consultants, Inc.	www.oicinc.com	173-174
OceanServer Technology, Inc.	www.ocean-server.com	64
ODI Advanced Technology Systems	www.odi.com	132
Odom Hydrographic Systems & Imagenex Technology	www.odomhydrographic.com	3

OCEANS 2005 Exhibitor List
September 19-23 - Washington, DC

Exhibitor	Website	Booth
	www.imagenex.com	
Office of Naval Research	www.onr.navy.mil	49-50
Optech Incorporated	www.optech.ca	189
ORE Offshore	www.ore.com	206
Paroscientific, Inc.	www.paroscientific.com	133
Phoenix International, Inc.	www.phnx-international.com	154
PMI Industries, Inc.	www.pmiind.com	96
PREVCO Subsea Housings	www.prevco.com	131
Pro Battery Specialists	N/A	112
RBR Ltd.	www.rbr-global.com	211
RD Instruments	www.rdinstruments.com	121-122
Remote Ocean Systems	www.rosys.com	66
RESON	www.reson.com	72
Schleifring	www.schleifring.com	151
Science Applications International Corporation	www.saic.com	35-36
Sea Con Brantner & Associates, Inc.	www.seacon-usa.com	205
SEA CON/Phoenix Inc.	www.seaconphoenix.com	102
Sea Sciences, Inc.	www.seasciences.com	108
Sea-Bird Electronics, Inc.	www.seabird.com	118-119
Seaeye Marine Ltd.	www.seaeye.com	1
SeaRobotics Corporation	www.searobotics.com	113
Seaview Sensing Ltd.	www.seaviewsensing.com	29
Seimac	www.seimac.com	191
Service Argos, Inc.	www.argosinc.com	188
Sidus Solutions, Inc.	www.sidus-solutions.com	146
Smithsonian Institution	www.si.edu/marinescience/	166
SonarData	www.sonardata.com	15
Sonardyne Inc.	www.sonardyne.com	40
Sonatech, Inc.	www.sonatech.com	144
Sound Ocean Systems	www.soundocean.com	161
South Bay Cable	www.southbaycable.com	134
SouthCoast Development Partnership	www.southcoastdev.org	5
SouthCoast Development Partnership	www.southcoastdev.org	6
SPAWAR SSC	www.spawar.navy.mil/depts/d30	167-168
Student Posters	N/A	79-86
Subconn Inc.	www.subconn.com	126
Subsea Technologies, Inc.	www.subseatechnologies.com	219-220
Sutron Corporation	www.sutron.com	177
SyQwest, Inc.	www.syqwestinc.com	226
Tenix LADS Inc.	www.tenix.com	117
The International SeaKeepers Society	www.seakeepers.org	106
The National Defense Center of Excellence for Research in Ocean Sciences (CEROS)	www.ceros.org	183
The UOV Company	www.uovehicles.com	110
Trimble	www.trimble.com	208
Triton Imaging, Inc.	www.tritonimaginginc.com	124
TSS (International) Ltd	www.tss-international.com	78
U.S. Geological Survey	marine.usgs.gov	227-228
VideoRay	www.videoray.com	212
WET Labs Inc.	www.wetlabs.com	104-105
YSI / Endeco / SonTek	www.YSI.com	217-218
Zevulun Marine Systems Ltd.	www.aquamate.biz	153

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SeaEye China Success Recognized

Shadow government minister, Mark Hoban MP, visited Seaeye's factory in Fareham, England, following the announcement of the company winning a major order from China for the oil and gas industry. The company, which was formed in 1987, is a manufacturer of electrically operated underwater ROVs, with sales globally to the offshore oil and gas industry, marine science establishment, the military and the emergency services. During his tour of Seaeye's development and assembly areas, Mark Hoban said it was a great achievement for the company to have broken into the Chinese market.

"When people talk about a threat from China, Seaeye's success proves there are in fact opportunities for a two way trade." He added: "With gloomy talk about manufacturing business in the UK, it is good to see that those companies that are innovative, and look for new markets, thrive."

JRC Debuts Doppler Sonar

Japan Radio introduces to the JLN-550 Doppler Sonar. The JLN-550 is a 2- or 3-axis Doppler sonar designed to offer enhanced speed accuracy and stability of display, achieved with a new compact dual frequency transducer that is less affected by aeration and can be mounted in a bow location. Using a 240 KHz 4 beam pulse pattern for bottom tracking, speed over the ground (SOG) can be shown in water depths below keel of approximately 2m to 250m, while in the high frequency (2MHz) mode, water tracking allows speed through the water (STW) from depths below keel of 3m and greater. A new large LED display gives excellent presentation of vessel ahead/astern speeds and bow port/starboard motion. An optional rate gyro provides 3-axis operation for stern port/starboard motion.

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Fugro Pelagos Wins NOAA Deal

Fugro Pelagos, Inc. won a contract with the National Oceanic and Atmospheric Administration (NOAA-NOS) to provide Hydrographic Surveying and Related Support Services. The Indefinite Delivery Indefinite Quantity contract is for 5-years, and not-to-exceed $50,000,000. An initial Task Order has begun, valued at just under $6,000,000 for operations in remote portions of Alaska waters, using multiple vessels, and RESON 8111 and 8101 multibeam echo sounder systems. Future operations can include multibeam echo sounder, side scan sonar and hydrographic LIDAR anywhere in US waters, including Alaska, Hawaii, the Territories and Great Lakes areas.

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USN Assists Russian Sub Rescue

The U.S. Navy sent a remotely operated submersible vehicle to assist in rescue efforts for a Russian submarine, caught in a fish net off the eastern Russian coast, according to a statement released by the U.S. Pacific Fleet. "At the request of the Russian Navy, we are preparing to deploy a team from the Navy's Deep Submergence Unit to assist with the situation," the statement read. The submersible, called a "Super Scorpio," is capable of cutting one-inch-thick steel cable. The United States and Russia are participants in the International Submarine Escape and Rescue Liaison Office (ISMERLO), the statement said, noting that both countries participated in submarine rescue exercise Sorbet Royal off the coast of Italy in June 2005.

Official U.S. Navy file photo of the "Super Scorpio" remote operated vehicle (ROV) to a safe recovery aboard the special mission charter ship M/V Kellie Chouest. U.S. Navy photo by Photographer's Mate 1st Class Daniel N. Woods

Low Cost PC Based Sonar for Windows

CruzPro Ltd. has developed what it calls the first dual frequency PC based color sonar that works in both standard Analog and Digital Signal Processing (DSP) modes. The PcFF80 interface box offers 2560 watts peak-to-peak (320 watts RMS) and will work to 1000 feet at 200Khz and more than 1500 feet at 50Khz. The PcFF80 will turn any laptop or desktop PC running Win98, WinXp or Win2K into a high resolution color sonar unit for less than $1,000, including transducer.

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C-Surveyor AUV Far East Campaign

C&C Technologies wants to mobilize one of its C-Surveyor deepwater AUVs to the Far East in the beginning of 2006. The company is currently discussing projects with several operators in the region to align time schedules and budgets. Thomas Chance, president of C & C Technologies, Inc., said, "We are uncertain that there is enough work in the Far East to justify the mobilization costs. In order for us to expand our AUV services to this region, we must secure several pending projects."

C&C is presently finishing up the customization of its next generation AUV, the C-Surveyor II. Once completed, C-Surveyor II will embark on several months of Gulf of Mexico projects. When these GOM projects are completed, a decision will be made regarding mobilization to the Far East. Meanwhile, the C-Surveyor I is currently

working in Brazil and will transit to West Africa in July for various pipeline surveys in that region.

C & C's AUVs collect detailed data including multibeam bathymetry and imagery, chirp side-scan sonar, and chirp sub-bottom profiler data. Sub-sampled data is then acoustically transmitted from the AUV to the support vessel in real-time, thus allowing on-board engineers to make informed route decisions and perform on-the-fly quality assurance.

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WesternGeco Conducts Survey

WesternGeco said that Sabah Shell Petroleum Company Ltd. has contracted the company to conduct a high-resolution Q-Marine survey over its St. Joseph field, offshore Sabah, Malaysia. The survey, which commenced in June, is the first Q-Marine project in Southeast Asia and will cover approximately 100 sq. km. The shallow, structurally complex St. Joseph reservoir produces oil and gas in an area that poses many surveying and imaging challenges. Strong currents, numerous obstructions and infrastruc-

MTS ROV Committee Announces Scholarship Winners

Kevin Bretney, David Kunz, Brady Gibbs, and Justin Leidwanger have been selected as recipients of the Marine Technology Society's 2005 ROV Committee Scholarships. In addition, Yuko Yokazawa and Kathy Keyton received special ROV Committee Scholarships exclusively for MATE students. Bretney, who will be a freshman at Franklin W. Olin College of Engineering, was awarded $5,000; Kunz who will be a freshman at Gonzaga University in Spokane was awarded $2,500. Gibbs is a marine/mechanical engineering major at Texas A&M University in Galveston, and Leidwanger who is pursuing a masters in nautical archaeology at Texas A&M University in College Station each received $1,250. As winners of the MATE (Marine Advanced Technology Education) ROV Committee Scholarships, Yokazawa who is a marine science and technology major at Monterey Peninsula College received $3,000, and Keyton who is pursuing a degree in marine technology at Cape Fear Community College will receive $2,000. All will be recognized during the Awards Presentations at Underwater Intervention '06 in New Orleans, Louisiana. Drew Michel, chairman of the ROV Committee of MTS initiated the scholarship program in 1994. Since then it has awarded over $65,000 to deserving students.

ture, combined with difficult near-surface conditions, have hindered previous conventional survey attempts to image faults and reservoir sands. The Q-Technology vessel, Geco Topaz, is conducting the survey towing six 3000-m cables with a separation of 30 m, using the WesternGeco proprietary calibrated Q-Marine source.

Ocean Science Training Bill Announced

Senator Lautenberg (D-NJ) introduced the Ocean and Coastal Literacy in Urban and other Environments Act (S. 1465) to strengthen programs relating to ocean, coastal, and Great Lakes science training by providing coordination of efforts, greater interagency cooperation, and the strengthening and expansion of related programs administered by the National Oceanic and Atmospheric Administration, and to diversify the ocean, coastal, and Great Lakes science community by attracting underrepresented groups. (HK Law)

Triton Enhances Seismic Data Logger

Triton Imaging, Inc. has released version 1.5 of its new seismic data logger, Triton SB-LoggerTM. New features include: 24-bit analog interface utilizing COTS A/D boards and designed to provide high resolution data capture with minimal user interaction; band pass filtering with graphics-based controls for setting low- and high-end values; power spectrum display tied to band pass filter; logging and display of event marks with non-overwriting annotation; full-screen display for maximum viewing of seismic profile data; heads up navigation display with large, easy-to-read characters and graphics

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U.S. Navy to Test New UUV

The AN/BLQ-11 Mine Reconnaissance System was loaded aboard a nuclear powered fast attack submarine for testing on July 7.

The Navy was scheduled to launch the UUV from Minneapolis/Saint Paul and recover the UUV while submerged during a series of tests to be conducted during the later part of July.

The AN/BLQ-11 is a UUV with capabilities that may have far-reaching implications. The system is a program run by the Navy's Program Manager for Unmanned Undersea Vehicles. Key testing activities include the Naval Sea System Command's Undersea Warfare Center Newport division (Technical Direction Agent) and the Boeing Company (System Contractor).

"The system is comprised of two UUVs, a recovery arm, a power stow, a Command and Control stow, and a spare stow," said electronics technician chief (SS) James Jeffery, the AN/BLQ-11 leading chief petty officer for Submarine Development Squadron 5 UUV Detachment. The recovery arm weighs in at about 4,400 pounds and is the heaviest part of the system.

Now installed on the boat and undergoing a series of pier side checkouts, the AN/BLQ-11 is set to undergo its first of two at-sea submarine demonstrations of the two-tube recovery approach. Based on the success of these tests, UUV technology may show significant advancement. The unique part of this system is the recovery arm, which is the first system designed to allow a submarine to capture an autonomous UUV and recover it using two torpedo tubes.

"It employs what they refer to as a two-tube recovery approach," said Naval Undersea Warfare Center (NUWC) test director, Richard Thornton. "The UUV is impulse-launched from the lower starboard torpedo tube just like a weapon. The recovery arm is extended from the upper starboard torpedo tube.

Following autonomous UUV operations, the UUV is programmed to acoustically home and dock to the recovery arm using advanced high frequency sonars. Once the UUV is docked, the recovery arm manipulates it back into the lower tube, where it is retrieved, backhauled, and ultimately refurbished for reuse."

"It is a brand new technology," said Thornton. "It's a brand new approach to launching and recovering vehicles, and that's a very complex evolution. The AN/BLQ 11, a research and development program, will provide technology and valuable lessons learned for the next generation of unmanned undersea vehicles.

"The real purpose of this system and associated submarine testing is to demonstrate the launch and recovery capability, so that the technology, if it works, can be applied to future 21-inch UUVs," Thornton said.

Benthos Founder Retires

Coonamessett Inn, Falmouth, Mass: Over 200 marine technology and oceanographic luminaries gathered to pay tribute to an industry great. Samuel Otis Raymond, 76, was honored by his seven-year Chairman, Steve Fantone. Fantone met Sam at four A.M. in an airport 19 years ago, and Sam was the only one alert enough to hold a conversation - "that was some time ago and it's been fun all the way".

Sam graduated from MIT in 1950 with a degree in mechanical engineering. He became associated with Doc Edgerton while working on underwater products at EG&G. He started Benthos in his barn in Falmouth in 1962. Sam thanked all in attendance and honored many past employees and colleagues. With the expertise and energy of 750 employees (over the years) Benthos has grown from a barn-sized enterprise to a multi- million dollar publicly-traded corporation that is traded on the NASDAQ.

Sam has four children, represented at the banquet by daughter Nixie. She ensured that no one walked away with any illusions about what growing up with Sam as a dad was like, saying "most children are looked after by their parents, but it was much different in our family. At a very early age we, as Sam's kids, had to really watch out for him. Sam bungee-jumped, sky-dived, scuba-dived, and did all sorts of 'out there' things. He taught us to explore ideas, solve problems and pursue our dreams."

WHOI Director Bob Gagosian lauded Sam for his impeccable character, values and work ethic. Klein

(L to R) Old buddies Marty Klein and Sam Raymond remember the "good ol days" when they started their companies.Both have since sold their companies and have retired.

Sonar Systems founder Marty Klein introduced himself as an "old retired engineer" who worked with Doc Edgerton and Sam at MIT. Marty thanked Sam for his friendship and unwavering mentoring during the startup of both of their companies.

Ron Marsiglio, the current president of Benthos, presented Sam with a pair of electronic image stabilized binoculars "with which to view the world." Marsiglio stated that before he met Sam, he had "never met anyone whose mind was so un-grounded in this time and space" and that "Sam will always be the founder of Benthos...no one can take that away from him."

Another buddy, Jack Crossen of National Marine Fisheries Service, said that when Sam told him the name of his new company, he said that "the benthos aurous is a bottom dwelling fish that scavenges the sea floor for food, which tells you something about how frugal Sam is."

Jack Morris, the first official employee of the Barn Crew, intoned that "no matter how tall you are, you always look up to Sam."

I was honored to be invited to attend and I wish Sam and his lovely wife happy trails in their around-the-world adventure.

— Maggie Merrill

Cohan Joins Schilling Robotics

Steve Cohan has joined Schilling Robotics, LLC as director of control systems engineering. Using his experience in control systems for a wide variety of products (from robotic surgical instruments to aerial drones to ROVs), he will focus on enhancing product performance features and robustness. His work will apply to Schilling Robotics ROVs and to the Remote Systems Engine, a family of software and hardware modules that can be used to control almost any type of remotely operated subsea system. This is Cohan's second employment at Schilling Robotics. He previously worked for the company for four years, first as a control systems engineer and later as chief engineer for software and controls. In the interim he has gained broad experience in a wide range of complex electro-mechanical control systems.

"Steve brings to our company almost two decades of experience in software design for remotely controlled devices, and he also has expe-

Scuttlebutt

Roger Race, formerly of YSI/Endeco is now general manager with Brooke Ocean Technology USA, New Bedford, Mass.

Ted Curley, of EPC Labs, has left the family fold and is now serving as Marketing Manager of TSS, Inc.

Bob Lobecker of Sea Beam, MTS, MOTN and RIMES fame has re-tooled Technical Marketing Associates (TMS) providing consulting services to the marine and engineering fields.

Ken Jordan, one of the founders of Hydroid, Inc. resigned his post as president in June to pursue other opportunities.

John Irza, formerly of Sygnus Technologies has joined Bluefin Robotics as sonar systems engineering director.

Battelle-Columbus, Ohio announced that it purchased Bluefin Robotics of Cambridge, Mass. in May.

Steve Withrow of L-3 Communications Klein Sonar is now re-energizing Trinity International to provide management, strategic planning, and marketing services to the entire universe.

Sam Raymond, founder and president of Benthos, finally (only kidding, Sam) stepped down effective Tuesday August 9. He threw an amazing farewell party for himself and we all enjoyed the proceedings, food and drink immensely. (See story on page 49)

Jaimie D. Graham, son of MTR online.net's **David Graham** (also of Sea Technology fame), starts his Ph.D. studies in ocean engineering this September at the University of Hawaii. Jaimie is an alumnus of Florida Atlantic University in Boca Raton.

Benthos's Chairman, **Steven Fantone's** son, **Stephen** will graduate this coming spring from MIT's Ocean Engineering program. He is very interested in underwater imaging and underwater vehicles.

rience in project management and strategic product development," states Schilling Robotics CEO Tyler Schilling. "The breadth of his experience, which runs from medical to aerospace to subsea, fits well with our emphasis on creating products that use innovative technologies from diverse disciplines."

Cohan played a key role in developing flight control software for an unmanned aerial vehicle (drone) that serves as a target for missile testing and fighter pilot training. The issues on this project are similar to those for an ROV: remotely controlling a vehicle over a long distance, using extremely software-intensive control systems, and dealing with many different electro-mechanical devices that contribute to overall operation and control.

Cohan holds a BA in science systems from the University of California, San Diego, and a MS in mechanical engineering from the University of California, Los Angeles. He also holds two patents for procedures used in robotic orthopedic surgery. He will be based in Schilling Robotics' headquarters in Davis, Ca.

Oceaneering's Nelson Named MarAd Chief Counsel

Julie Nelson was appointed as Chief Counsel for the Maritime Administration. "Julie brings the right combination of experience to the job," said Acting Maritime Administrator John Jamian. "Her experience in industry and her credentials in the field of Maritime and Admiralty Law give her a solid understanding of the work we do here,.

Nelson joins MarAd from Oceaneering International, Inc., an ocean engineering development group, where she served as General Manager and Maritime/Contracts Attorney. Previously she served as General Counsel and General Manager for Nauticos Corporation of Hanover, MD, also a high-technology ocean engineering firm.

Nelson received her B.G.S. from Indiana University, and did graduate work at the Ecole National D'Administration in Paris.

Widder Inducted into Diver Hall of Fame

Harbor Branch deep-sea explorer and bioluminescence expert Dr. Edith Widder became one of the newest members of the Women Divers Hall of Fame. This elite group includes such notable women as Zale Parry, star of the Sea Hunt series, and Dr. Sylvia Earle, world record holder and National Geographic explorer-in-residence. HBOI president and CEO Dr. Shirley Pomponi, who now serves on the group's board of directors, was inducted in 2003. Widder was first certified as a scuba diver in 1965 and has been at Harbor Branch for more than 15 years. She is also an adjunct research professor in the Earth & Planetary Sciences Department of The Johns Hopkins University, a distinguished scientist adjunct at the Monterey Bay Aquarium Research Institute, and an adjunct professor of biological science at both Florida Institute of Technology and Florida Atlantic University. In 1985, working from a Deep Rover, Widder was the first person to make video recordings of bioluminescence in the ocean, which is the light chemically produced by many open-ocean animals. She is a world authority on the measurement of bioluminescence and co-holds a patent on the U.S. Navy's standard device for measuring bioluminescence throughout the world's oceans.

RESON Wins Egyptian Navy Contract

RESON Mediterranean Srl has delivered and completed the installation of a survey system that includes a RESON SeaBat 8124 multibeam system and PDS2000 Software to the

Obituary: Charles David Keeling

Charles David Keeling, a leading authority on atmospheric greenhouse gas accumulation and climate science pioneer at Scripps Institution of Oceanography, University of California, San Diego (UCSD), died Monday, June 20, 2005, while at his Montana home, of a heart attack. He was 77 years old. Keeling has been affiliated with Scripps since 1956. Keeling was the first to confirm the rise of atmospheric carbon dioxide by very precise measurements that produced a data set now known widely as the "Keeling curve." Prior to his investigations, it was unknown whether the carbon dioxide released from the burning of fossil fuels and other industrial activities would accumulate in the atmosphere instead of being fully absorbed by the oceans and vegetated areas on land. He became the first to determine definitively the fraction of carbon dioxide from combustion that remains in the atmosphere. The Keeling record of the increase in atmospheric carbon dioxide measured at Mauna Loa, Hawaii, and at other "pristine air" locations, represents what many believe to be the most important time-series data set for the study of global change. "There are three occasions when dedication to scientific measurements has changed all of science," said Charles F. Kennel, Scripps director. "Tycho Brahe's observations of planets laid the foundation for Sir Isaac Newton's theory of gravitation. Albert Michelson's measurements of the speed of light laid the foundation for Albert Einstein's theory of relativity. Charles David Keeling's measurements of the global accumulation of carbon dioxide in the atmosphere set the stage for today's profound concerns about climate change. They are the single most important environmental data set taken in the 20th century. Dave Keeling was living proof that a scientist could, by sticking close to his bench, change the world. The loss is the world's loss, and the loss is also Scripps's, but, most of all, it is his family's loss." "Dr. Keeling will be sorely missed by the NOAA family," said Retired Navy Vice Adm. Conrad C. Lautenbacher, Ph.D., under secretary of commerce for oceans and atmosphere and NOAA administrator. "As a scientist, he will forever be remembered by one of the most recognizable graphs in science, the sloping curve that symbolically represents the atmospheric carbon dioxide record he derived. His pioneering work on atmospheric carbon dioxide fundamentally changed the way we view the planet and our role on it and firmly placed him in the pantheon of history's great scientists. He has left us with the eternal gift of his vast knowledge, but more importantly he left us and future generations with the gift of inspiration. His legacy will inspire future generations to follow in his footsteps in the quest for scientific discovery."

Hydrographic Division of the Egyptian Navy. The award also includes training of Egyptian Navy personnel.

In cooperation with RESON's Egyptian representative, Surveying System, RESON Mediterranean Srl delivered and installed a SeaBat 8124 system and accessories, including a PDS2000 Hydrographic Software Package. RESON Mediterranean personnel will also provide a full training course, including both theoretical and practical training on the sonar hardware and software. The SeaBat 8124 Multibeam system operates at 200 kHz and is a high accuracy system, even on the outer beams. It features an advanced bottom detection system that incorporates both amplitude and phase detection methods.

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AXYS, Navcom, ITS to Provide Water Monitors

AXYS Technologies Inc. received an order through NavCom Technology Inc. to provide the Naval Oceanographic Office with high precision water level monitoring buoys using RTK-StarFire global positioning system (GPS) technology. The buoys are being provided under a contract from NavOceanO held by ITS Corp.

The TRIAXYS GPS buoy, using a NavCom GPS receiver, will be used to provide real-time, accurate water elevation data by means of acquiring GPS elevation correction data, applying the solid earth tide corrections within the GPS receiver, and providing this data at configurable intervals to NavOceanO. The first set of GPS buoys was to be delivered in March 2005.

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Nautronix Launches Online Communications

Nautronix launched its new global online communications system to "allow customers greater access to information and promote greater integration between its network of companies," according to CEO Mark Patterson. The new system includes a website and intranet functionality, controlled by Nautronix via a specially developed content management system and ensures that the information is constantly updated to provide the most current view of Nautronix, its products, and its services. He added, "What we now have is much more. It is a business system that we can manage in-house to provide our customers and employees with instant access to all of the up-to-date information they need about the

Scripps Nierenberg Prize Awarded

The fifth annual award honoring the memory of William A. Nierenberg, who led Scripps Institution of Oceanography, UCSD, as director for more than two decades, will be awarded to BBC nature filmmaker Sir David Attenborough. Attenborough received the Nierenberg Prize for Science in the Public Interest during a ceremony in front of the Birch Aquarium at Scripps. He was presented with a bronze medal and $25,000.

"It is a pleasure to award the Nierenberg Prize for Science in the Public Interest to Sir David Attenborough, whose distinguished career spans a half century," said Scripps Director Charles F. Kennel. "The three key words that best describe Attenborough's life's work are: science, public and above all, interest. He has found ways to interest all of us in how Earth's creatures live and by so doing has enriched the lives of all humans."

Attenborough has traveled the world making innovative nature programs for more than 50 years. Shortly after joining BBC in 1952, he began hosting the 10-year-long series, Zoo Quest, which helped establish his career as well as the reputation of BBC's Natural History Unit.

A landmark in television came with 1979's Life on Earth, a series about how life evolved on the planet, which required 1.25 million feet of film and visits to 30 countries.

Among numerous honors over the years, he was elected a fellow of the Royal Society — the UK's national academy of science — in 1983 and received a knighthood in 1985. He is a founding member of the World Wildlife Fund and a patron of the World Land Trust, which purchases rain forest and other lands to preserve them and their animal inhabitants.

company and its products."

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Kongsberg Waterlooville Plant Relocates

Kongsberg Maritime Ltd.'s Waterlooville facility recently relocated to larger premises, a move necessitated by increased business levels in its U.K. naval markets. Site administrator Sandra Holland said "The new site provides an improved working environment for our staff and customers." The facility specializes in the application of proprietary and Kongsberg Group (Horten, Norway) technology for U.K. maritime defense applications.

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Octopus Printer Sales

CodaOctopus Ltd. won an approximate $101,000 contract to supply "specially adapted" Octopus 200 series printers to Atlas Elektronik GmbH (previously part of STN Atlas Elektronik GmbH), Bremen, Germany. The 20-in. printers will be integrated into Atlas' naval submarine sonar systems, according to a spokesman. Octopus 120 series and 200 series gray-scale printers have a proven track record and are widely used in geophysical survey and defense applications. They produce continuous images onto thermal paper or film for hardcopy output of both side-scan and seismic geophysical data and other continuous data.

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Oceanscan Announces Appointments

Oceanscan Limited, a provider of underwater products to the Defence, Oil & Gas and Telecommunications industries, has made two key staff additions. Dr. Victor Svet, Doctor of Science (Phys.-Math.), a specialist in applied acoustics, has joined Oceanscan as Head of Research & Development. Dr. Svet graduated from the Department of Radio Systems of Moscow Electro-Technical Institute of Communication and was subsequently offered a permanent position at the Acoustics Institute where he has been working for more than 38 years on problems related to the reception and processing of acoustic signals. His first research projects were concerned with studying non-linear correlations in acoustic signals and noise generated by high-power mechanisms with rotary units, the outcome of this theory being new efficient methods for the acoustic remote sensing of aircraft engines and turbines. Further research projects were concerned with the development and application of the ideas and methods of coherent optics and holography for space-time signal processing in underwater acoustic observation systems.

Oceanscan also announced the appointment of Donald Sandilands MSc, as Manager of Research & Development. Sandilands has been working in the subsea industry for 20 years since graduating from Heriot Watt University. Initially working in Aberdeen as an Electrical Engineer designing ROV's and intervention tooling systems, he has spent the last 10 years with Perry Slingsby Systems in Jupiter, Fla.,, as a Senior Electrical Engineer, the last five years of which as Electrical Engineering Group Leader with responsibility for the development of the electrical systems on a wide range of remotely operated vehicles.

Manel Monteiro, Director of Sales & Marketing at Oceanscan said, "Oceanscan will be the first company to introduce an underwater acoustic laboratory in Aberdeen. The appointment of Dr Svet and Donald Sandilands is a major contribution to our commitment to ongoing research and development in underwater acoustic technology. Both understand Oceanscan's aims and believe that Oceanscan is at the forefront of sonar technology."

C&C, NavCom Extend Agreement

C & C Technologies, Inc., a survey company, and NavCom Technology, Inc., a subsidiary of Deere & Company, announced a five year extension to their agreement for the distribution of C-Nav GPS. The agreement continues to be exclusive with respect to offshore operations pertaining to satellite navigation positioning on projects for surveying, mapping, geophysics, mining, cable laying and offshore construction, installation, inspection, and maintenance operations.

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SED: An Emergency Escape Underwater Breathing Apparatus

Draeger Safety, Inc. launched the first delivery of 45 Submarine Escape Devices (SED) delivered in April 2005 to the Escuadron de Submarinos of the Ecuadorian Navy in Guayaquil, Ecuador. The SED is a personal escape apparatus for use by marines or Submarine personnel to exit from a stricken submarine. These first 45 units are destined for the shipyard HDW class 209-1300 Submarine S-102 Huancavilca. Introduction to the Ecuadorian Navy started in early 2003 and was managed together with project partner, Alfred Rytz of SIPASA. SIPASA and Draeger Safety, Inc. are currently working on another Submarine Escape Devise project for Ecuador's Navy to procure units for the second Submarine named Shyri.

A team from Draeger Safety traveled to Ecuador in mid-May to finalize the delivery of the product and

Draeger Safety's SED team with representatives from the Ecuador Navy.

conduct operator and maintenance training to the Submariners. The training was at the Eschule Submarinos (Submarine Training School) and the Naval Academy located in Ecuador.

With the new SED, Draeger has expanded the product range available for Submarine safety and atmosphere conditioning for conventional diesel-electric Submarines. The SED was developed exclusively at Draeger's Pittsburgh office to replace the Draeger TR75 escape unit which had been out of production since the late 1980's. The SED is a fully functional semi-closed circuit re-breathing device using a nitrox mixture as the breathing gas and designed to be used up to a depth of 75 m/246 fsw. A unique feature of the SED is its combined breathing bag/buoyancy chamber. Shaped in the form of a horse-collar type life preserver, it functions as a re-breather breathing bag during the ascent phase of the escape and as a life preserver at the surface when fully inflated, keeping the submariner's head out of the water and in a face up attitude. Signal equipment is provided to help alert rescuers to the submariner's position.

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Tide Gage Systems

Sutron Corp. of Sterling, Va., supplies tide gage systems to the US National Ocean Service (NOS):

- G3 Main Gage - Data logging and telemetry for all approved NOS water level and weather sensors
- G3 Redundant Gage - Data logging for a redundant water level sensor and redundant weather sensors, operating along side the G3 Main Gage as a backup
- G3 Hydrographic Station - Water level monitoring in tidally-

affected inland streams and research applications Gages include Sutron's XPert data logger. XPert loggers run Windows CE, and can communicate over three devices while collecting data. Four MB are available for data and custom processing in BASIC. XPerts include software made for NOS applications.

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SeaBotix Adds to the LBV Line

SeaBotix has added to the LBV range of ROV systems making a total of 12 standard systems. There are five primary categories: LBV150, LBV300, LBV600, LBV1500 and "Fly Outs". The number designates the LBV's depth rating in meters and the "Fly Out" category offers three systems in the deeper depth

ratings. Built on the LBV platform, each model includes the standard features such as powerful thrusters, small diameter umbilical, two forward cameras, lamp tracking camera, lateral thruster, auto depth/heading, and video overlay. All the 300 m and deeper LBV systems are available with the additional two forward thrusters giving the LBV extra thrust.

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Magnum's Fin Wrap

Magnum's new Fin Wrap underwater cutting rod is designed to burn longer and through thick materials. The new double spiral outer adhesive wrap is designed to insulate the diver from shock as well as provide a superior shield to slow consumption. The overlapping outer wrap resembles a fish fin and is designed to eliminate side burning. Fin Wrap rods come 50 to the box and can be ordered in either high visibility yellow or traditional black. The rods fit any brand underwater cutting torch using 3/8" collets.

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The Underwater Tiltmeter

Applied Geomechanics Inc. (AGI) introduced the Model 802 DeepWater tiltmeter for underwater measurement of structural and machine movement, designed for the monitoring of oil platforms, production facilities, pipelines and pipe laying equipment. They also measure pitch and roll of surface and underwater vehicles. The standard housing withstands pressures in excess of 250 bars (3625 psi). The internal sensing element is a precision tilt transducer similar to those used in aircraft and marine gyroscopes. The high-gain version measures rotational movements smaller than 0.0001 degree, while the wide-angle version, with an operational range up to +/-70 degrees, accurately monitors the movement of underwater machinery. DeepWater tiltmeters are available with analog voltage, 4-20 mA, RS232 and RS485 outputs.

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Rockland Oceanographic

Rockland Oceanographic Services Inc. - a leader in marine microstructure turbulence technology - offers high-accuracy instrumentation and technical services for oceanographic research and monitoring. The company is also the North American representative of Japan's Alec Electronics Co. Ltd. Rockland's product line-up includes multi-parameter turbulence profilers and towed systems; single-channel and multi-channel data loggers for CTD, fluorescence, turbidity; and electromagnetic current meters.

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Multi-Function C-90 Joystick

The new Cobra style joysitck is designed to be flexible, reliable and durable. To this end, the C90 can be custom configured from a list of standard options, including both momentary and alter-

Rotech T8000 Subsea Excavation System

The Rotech T8000 is a range of patented subsea excavation tools operated by Rotech Subsea Limited. The Rotech tools excavate with a high speed but low pressure column of water. The Rotech T8000 can be used for a wide variety of subsea excavation requirements, such as:

- Pipeline, umbilical and cable trenching, pre-trenching or deburial.
- Pipeline free-span remediation.
- De-burial of subsea templates, well-heads or jacket members, from seabed materials, mud slides or drill cuttings.
- Salvage of dropped equipment or vessels.
- Removal of rock dump.
- Site preparation for subsea installations
- Civil excavation works, including harbor/berth clearance, channel maintenance and site preparation for sea defense works.

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Shark Marine Technologies

Shark Marine Technologies, a manufacturer of underwater imaging equipment, ROV and underwater survey systems has released the Navigator, an underwater navigation and sonar unit designed for diver operation. The sonar and navigation data are displayed on a five-in. LCD screen and controlled by the diver through Windows based software. Weighing 2.5 lb. in the water, including the front mounted scanning sonar, the unit is designed to be portable. The will be used for, but not limited to, mine countermeasures, Navy ops, search and recovery, hull inspections, underwater archaeology, diver guidance and surveillance.

Options include GPS, Digital Camera, Acoustic Positioning System (APS), Magnetometer or cable tracker, Depth and compass to provide the diver with even more information and to keep a log of underwater activity. The Navigator can also be attached to a Diver Propulsion Vehicle (DPV) for navigation and obstacle avoidance.

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nate switches, see-saw potentiometers, trigger switches and direction sensing and center detect switches. The C90 can also be configured as either a spring return or friction clutch device. Special potentiometers such as ganged, contactless (Hall effect) and oil filled are also available.

Applications areas include marine controls, cranes, gantries, hoists, lifts, conveyors and container handling equipment.

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Ameron Fiberglass Pipe

Ameron manufactures glass reinforced epoxy (GRE), vinylester and phenolic composite pipe and fittings globally and provides services, such as pre-fabrication of spools, assembly and installation training and field service anywhere in the world. Fiberglass piping is inherently corrosion resistant and lightweight. It also offers fire resistance and thermal insulating characteristics. Products are designed and available with special features of electrical conductivity, low flame spread, low smoke generation and low toxicity. Products are designed for use in normally wet service as well as for dry services, such as deluge piping, and are designed to resist exposure to fires as intense as jet fire (over 300 kW/m^2 heat flux).

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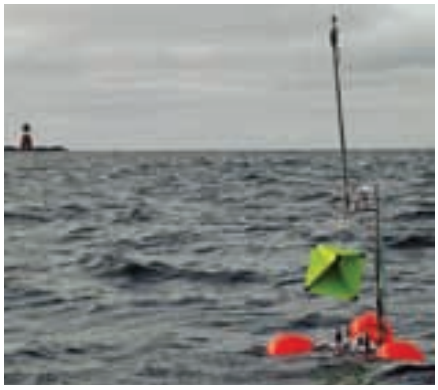
SONRAS: Sound Registration and Analyzing System



SONRAS is a Sound Registration and Analyzing System consisting of a submerged buoy and a Ship Borne control Station. The system is designed to records, presents and analyses acoustic noise in the frequency domain from 10Hz to 100kHz. The analysis is performed by Fast Fourier transform, and presented with few seconds delay.

The Instrument buoy is ported in a cage with weights and floats, making it stable in the sea. A mast is supporting the radio antenna and the GPS receiver.

- Weight 40 kg
- Hydrophone suspend able to 30 m depth
- Battery capacity for 8 hours
- Recommended frequency span 10 Hz to 100kHz

Exploring the Deep with a Unique Rope

The Woods Hole Oceanographic Institution (WHOI) began developing a new piston corer for retrieving sediments from the ocean floor. Once complete in 2006, the deep-water coring system will reportedly be the largest in the U.S. and among the biggest in the world. The corer's enormous weight - 25,000 pounds - coupled with the environmental demands associated with working in water up to 20,000 ft. deep presented major technical challenges to the system required to lower the corer to the sea floor then recover it, along with its ancient sediment samples.

The institute's new piston corer will be able to penetrate up to 160 ft. into the ocean floor, giving scientists a view of hundreds of thousands or even millions of years of climate and ocean history.

In the past, research vessels like those used by WHOI and other ships engaged in activities ranging from drilling to deep-water salvage typically used steel ropes to lift heavy objects. The new mission required new technology, particularly in the rope used and its ability to deploy and recover the massive corer while providing long and satisfactory life.

To support the 25,000-pound coring system and withstand the environmental demands presented by deep-water exploration, WHOI selected a custom braided, synthetic fiber rope from Puget Sound Rope, a unit of the Cortland Companies. The rope will be based on Puget Sound Rope's Plasma 12 x 12-strand, which uses Spectra polyethylene fiber from Honeywell Specialty Materials, as well as other products and technologies, to gain its incredible strength and other attributes. Spectra fiber, pound for pound, is 10 times stronger than steel.

Once completed, WHOI's rope will be nearly 23,000 ft. (7,000 m) long and, while just two inches in diameter, will be able to lift more than 350,000 pounds. The corer will be installed on the 279-ft. (85 m) research vessel Knorr, which is owned by the U.S. Navy and operated by WHOI.

The Knorr and its 2,700 sq. ft. of floating laboratory space are scheduled to begin work with the new piston corer in 2006.

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- Fourier analysing in the buoy, analogue and digital transfer by radio to the ship
- Selected data stored in buoy during operation
- GPS position determination

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Platinum HB: Engineered Hardband Solution

Grant Prideco has introduced Platinum HB, an engineered hardband solution. Designed for both operators and pipe owners, Platinum HB provides is designed to provide excellent casing wear performance and tool joint protection. Casing wear tests revealed a 31 percent reduction in wear to the casing over the nearest competitive hardbanding, according to the company.

At the same time, radial tool joint wear in casing was reduced 55% compared to the next best casing-friendly solution.

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Brunswick Commercial & Government Products

Brunswick Commercial & Government Products, formerly Boston Whaler Commercial & Government Products, is dedicated to

the needs of commercial and government customers with over 30 years experience building and supporting mission specific Law Enforcement Homeland Security, Special Operations/Combat, Fire/Rescue and Workboat craft. Offering commercialized Boston Whalers, Unmanned Surface Vessels, Brunswick hulls and VT Halmatic products including RIBs and composite craft up to 100 feet (328 m).

Kokes Offers Sub Services

Kokes Marine Technologies, LLC offers the Corsair RS-1 and Constellation RS-2 for charter. The two 48 ft. Diesel / Electric Submarines are based on the previous success of the RS Class Design. The RS Submarine fleet is available for worldwide charter to the offshore marine industries, research centers and qualified naval forces located in

the U.S. and abroad. The RS Submarine is an ideal platform for covert naval and security operations. Anti Submarine Warfare (ASW) and prototype system testing can be efficiently performed for a fraction of the cost normally allocated to such tasks. The RS Submarine has 8000 kg of reserve buoyancy and, therefore, is capable of carrying a myriad of bolt-on or internal ancillary equipment. Hydraulics as well as various voltage supplies and computer interface protocols are available for a broad range of applications. The submarines are deployed directly from the pier with up to six personnel onboard and arrive at the dive site under independent power. Operations are conducted without the need of support ships. The RS Class Submarines are capable of navigating over 400 nautical miles either on the surface or submerged in the snorkel mode, and are commanded by experienced retired U.S. Navy submariners.

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Offering commercial-off-the-shelf, mission-specific options and in-house custom capabilities.

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New Digital Underwater Communication System

ELAC Nautik recently introduced its new model UT 3000 for customers with extended communication requirements. In addition to the features of the UT 2000, this new underwater communication system is designed to be capable of establishing a digital link for data transfer and vocoder applications.

Different transmission modes enable the selection of the optimum communication channel. Standard and customizable interfaces of the UT 3000 support integration in the ship's communication network and enhance the communication options by interaction with connected systems.

ELAC Nautik's underwater communication systems family is complemented by the UT 2200 serving as an emergency system onboard of submarines or as a mobile device.

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New Ocean Measuring Instrument

Ocean Sensor Systems released the new OSSI-010-006 Wave Staff II water level sensor that combines a sealed, waterproof package, low power microprocessor and a temperature stable, sensing circuit. The Wave Staff II operates from 5.5V to 40VDC and has analog and RS232 serial data outputs. The serial data output string contains the water level & temperatures in ASCII or binary format.

The Wave Staff II can be programmed to free run or sample on demand. It is easily programmed via a PC serial port using our Wave Staff Interface Software. The Wave Staff II has two new features. The Coaxial Cable Staff eliminates the need for a separate water ground wire and both Staff & electrical cord are changeable. Price ranges from $942 to $1100 depending on staff length.

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Modular Batteries for UUV & Submersible Applications

Lithion Inc. introduced a new high-capacity modular battery system using Lithium-ion technology.

Based on the ASDS (Advanced SEAL Delivery System) battery developed for the U.S. Navy, it is designed to allow the safe storage of over 1.2 MW/hours of energy in a rugged, compact design. The system can be broken down into its three primary elements: the individual Lithium-ion cells; the Lowest Replaceable Units (LRUs); and the Battery Modules.

The individual cells are 3.6 volt (nominal), 350 Ampere-hour cells, and feature high-grade stainless-steel shells. Each cell is hermetically sealed using a laser welding system. In addition, each battery system is equipped with an electronics package known as a Battery Management System (BMS), which monitors the status of each cell in the entire battery system, in addition to battery temperatures in several locations.

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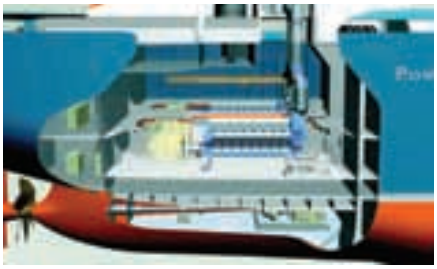
Wärtsilä: Providing the Power



Wärtsilä is The Ship Power Supplier for builders, owners and operators of vessels and offshore installations. Its global service network takes complete care of customers' ship machinery at every lifecycle stage. Wärtsilä is a leading provider of power plants, operation and lifetime care services in decentralized power generation.

Wärtsilä offers a single source for main and auxiliary engines from 520 kW (697 hp) to 80,080 kW (107,300 hp), generating sets, reduction gears, propulsors, efficiency rudders, control systems, seals and bearings.

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

COMMERICAL CERTIFIED DIVER

Job Location: USA, OR Portland

We are currently accepting resumes for experienced certified divers, requirements are as follows:

- A Min. of 5 Years Diving Experience. Topside and Underwater Welding, Propeller Repair & Polishing, General Marine Services & Light Marine Construction.
- Must be willing to relocate. This is a full time position.

If You Meet Our Requirements And Are Interested In Applying Please Send Resume By Fax To: (503) 286-2871 or Email To: devinesalv@msn.com

Marvin Smith
Fred Devine Diving & Salvage Co.
6211 N Ensign Street
Portland, OR 97217
USA

Phone: 503-283-5285
Fax: 503-286-2871
Email: devinesalv@msn.com
WEB: http://www.freddevinedivingandsalvage.com

DESIGN ENGINEERS

Job Location: New Zealand, Auckland

High Modulus (NZ) Ltd is a world leader in composite engineering for the marine industry.

We are currently expanding our Design Engineering Department and are seeking Intermediate and Senior level composite design engineers to work in our head office in Auckland, New Zealand.

Job Overview:
Structural analysis and design of sailing and motoryachts in composite materials. The job also entails work in the R&D area, some yard visits and a significant amount of client contact.

The Person:
Applicants should be tertiary qualified engineers with at least three years experience in naval architecture and/or composite structural engineering. Those with established design experience and the ability to work in a team environment would be preferred. Practical boatbuilding experience would be an advantage, as would a personal interest in boating.

Candidates wishing to apply should send a C.V with covering letter to:

Contact: Evelyn Craig
Company name: High Modulus (NZ) Ltd
Address: Private Box 302-191, North Harbour, Auckland, New Zealand
Email: engineer@highmodulus.co.nz
Website: http://www.highmodulus.co.nz/

Engineering Office Manager
High Modulus (NZ) Ltd
Private Box 302-191
North Harbour
Auckland,
New Zealand

Email: engineer@highmodulus.co.nz

FACILITIES TECH

Job Location: Bahamas, Lee Stocking Island

The Perry Institute for Marine Science (www.perryinstitute.org), a US non-profit organization that has been successfully running a marine biology research facility in the Bahamas since 1970, is seeking an energetic self-disciplined Facilities Professional for its marine research center located on Lee Stocking Island, Exuma, Bahamas. This is an on-island analytical problem-solving position involving all aspects of daily facility maintenance operations of a large self-supporting remote island. The ideal candidate will have hands-on maintenance experience with generators, electrical distribution systems, utilities, including water and wastewater systems, HVAC, refrigeration, marine diesel and outboard engines, vessel repairs/outfitting, heavy vehicles and equipment, fundamental construction, project management and computer knowledge. This is a hands-on position and the ideal candidate must be flexible with priorities, able to juggle between multiple demands, be relentless about work being done correctly, able to work outside in very warm conditions for a large part of the day. A team-oriented attitude is also required. This is a great challenge for great adventure for the right individual. Salary is commensurate with experience and additional compensation includes housing, utilities, travel, partial relocation, medical/dental coverage, vacation, and retirement benefits. No pets. Range is $32,000 to $36,000 DOQ. Fax resume with coversheet including salary requirements to: 561-741-0193 EOE/DFWP.

Ruth Ann Gonzalez
Perry Institute for Marine Science
100 North US Hwy One #202
Jupiter, FL 33477
USA

Phone: 561-741-0192
Fax: 561-741-0193
Email: hr@perryinstitute.org

INTERNATIONAL SERVICE MANAGER

Job Location: Germany, Hamburg

Leading a team of around 40 service engineers based in 8 European locations. Resource Management, Quality Control & Qualification to the optimum sattisfaction of our customers would be your task.

Oliver Schwarz
Pro Nautas GmbH
Kutterweg 1
Leer, 26789
Germany

Email: oschwarz@pro-nautas.com

MANUFACTURING ENGINEER

Job Location: USA, CA Oxnard

The Manufacturing Engineer is responsible for ensuring the correct manufacturing procedures, fixtures and tooling are developed and available for all production activities. The Manufacturing Engineer also assists with certain quality activities, e.g. nonconforming item disposition, procedure writing, problems analyses and recommendations. Performs any other manufacturing engineering functions, and assists other departments as needed. Maintains document control, performs other general engineering work, and reports as appropriate.

Eric Birns
BIRNS, Inc.
1720 Fiske Place
Oxnard, CA 93033-1863
USA

Phone: 805-487-5393
Fax: 805-487-0427
Email: ebirns@birns.com
WEB: http://www.birns.com/engrmfc1.html

MARINE ARCHTECT II

Job Location: USA, TX Houston

Floatover Analyst
Minimum of 8 years experience in motion analysis using MOSES, reduction of environmental data, mooring system modeling and design, LMU, DSU loose slot, barge ballasting, loads on the LMU/DSU. loads on the fenders, etc. 3-8 years experience

Permanent Position in West Houston, Texas.
Must be authorized to work in US for any employer.
Must be willing to relocate to Houston, Texas

Contact Renee Grimes, Technical Recruiter at 713 358 7164 or 800 364 2626 or via e-mail:

renee@bwresources.com

Renee Grimes
Bridgewater Carltech
24 Greenway Plaza #1303
Houston, Texas 77046
USA

Phone: 713 358 7164
Email: renee@bwresources.com
WEB: http://www.bwresources.com

MARINE ENGINEERING MANAGER

Job Location: Canada, Vancouver

- 10 years experience in design of ship systems and/or offshore engineering projects, particularly with regard to smaller specialized commercial vessels
- Demonstrated capability and experience supervising a team of qualified engineers and technologists
- Demonstrated capability and experience in preparing and meeting project schedules and budgets
- Qualifications suitable for registration as a Professional Engineer in the Province of British Columbia, Canada
- Familiarity with the development and implementation of quality assurance procedures in a design environment
- Strong inter-personal skills in dealing with Clients, suppliers, and personnel

Applicants must:

- Be capable, creative individuals with strong motivations to provide the highest standards of design for high performance working vessels
- Be able to work independently or as part of a focussed project team on the widest possible range of ship-design activities
- Be familiar with rules of major Classification Societies, Canadian and US National Authorities, SOLAS, and IMO
- Possess strong skills in AutoCAD, Word, and Excel
- Have excellent written and oral communication skills in English

Ken Harford, P. Eng.
Robert Allan Ltd.
Vancouver, British Columbia
Canada

Email: kharford@ral.bc.ca
WEB: http://www.ral.bc.ca

MARINE ENGINEERING TECHNOLOGIST

Job Location: Canada, Vancouver

- Training in the design of Marine Engineering Systems
- Strong AutoCAD skills
- Ideally 1-2 years experience in a shipyard or design office

Applicants must:

- Be capable, creative individuals with strong motivations to provide the highest standards of design for high performance working vessels
- Be able to work independently or as part of a focussed project team on the widest possible range of ship-design activities
- Be familiar with rules of major Classification Societies, Canadian and US National Authorities, SOLAS, and IMO
- Possess strong skills in AutoCAD, Word, and Excel
- Have excellent written and oral communication skills in English

Ken Harford, P. Eng.
Robert Allan Ltd.
Vancouver,
Canada

Email: kharford@ral.bc.ca
WEB: http://www.ral.bc.ca

MARINE INSTRUMENT TECHNICIAN

Job Location: USA, CA Bodega Bay

Bodega Marine Laboratory of the University of California has a current opening available for a marine technician to oversee, maintain and troubleshoot a variety of oceanographic sensors and moorings. For more information, please go to:

http://jobs.hr.ucdavis.edu/jm/ViewVacancy?id=3379

Conci Mack
Bodega Marine Laboratory
2099 Westside Road
Bodega Bay, CA 94923
USA

Phone: 707.875.2011
Email: cmack@ucdavis.edu
WEB:
http://jobs.hr.ucdavis.edu/jm/ViewVacancy?id=3379

MARINE MACHINIST

Job Location: USA, FL Ft. Lauderdale

Must be able to setup & operate manual mills & lathes with a broad knowledge of tools. Fabricate precision replacement or repair parts for all types of marine equipment from all types of metallic and plastic material of various sizes working from blue prints, sketches, samples or other instructions with speed & accuracy with little or no assistance. Be able to accurately use precision measur-

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

ing devices, have good to excellent blue print reading skills, good to excellent math and /or trig skill. Personal tools required. Be familiar with
- Shafting
- Tapers
- Threaded components
- Sleeve bearings
- Custom parts

Tom Krigger or Paul Engle
Bradford Marine, Inc.
3051 State Road 84
Ft. Lauderdale, FL 33312
USA

Phone: 954-791-3800
Fax: 954-583-9938
Email: employment@bradford-marine.com

MARINE MECHANICAL ENGINEER

Job Location: Canada, Vancouver

- Undergraduate degree in Mechanical Engineering
- Strong analytical skills
- Strong AutoCAD skills
- 5 years experience in design of ship systems and/or offshore engineering projects
- Familiarity with marine propulsion systems including conventional propellers, Z-drives, VSP, and waterjets
- Qualifications suitable for registration as a Professional Engineer in the Province of BC

Applicants must:
- Be capable, creative individuals with strong motivations to provide the highest standards of design for high performance working vessels
- Be able to work independently or as part of a focussed project team on the widest possible range of ship-design activities
- Be familiar with rules of major Classification Societies, Canadian and US National Authorities, SOLAS, and IMO
- Possess strong skills in AutoCAD, Word, and Excel
- Have excellent written and oral communication skills in English

Ken Harford, P. Eng.
Robert Allan Ltd.
Vancouver, British Columbia
Canada

Email: kharford@ral.bc.ca
WEB: http://www.ral.bc.ca

MARINE SHIP REPAIR/PROJECT MGR. US FLAG

Job Location: USA, GA Atlanta,

Estimate, mobilize, manage and control shipyard repairs contracts in varied U.S. locations. Experienced, well-organized candidate with hard-core proven track record for delivering projects ON TIME - WITHIN BUDGET. Responsible for administrative electronic reporting, i.e., CFR's, sound knowledge of governmental requirements (i.e., safety, EPA), compliances and protocol.

Ideal candidate: self-starter that is highly motivated and committed to delivering excellent work. US Citizen candidate must be willing to travel and multi-task when necessary. This is a position that will grow in managerial functionality as the new Marine Ship Repair Division is retrofitted and our division expands. Candidates with on-hands experience, capabilities and strong estimating skills will override all credentials.

Meg C. Skinitis
Mandaree Enterprise Corp
1660 Peachtree Str. NE
Suite 2307
Atlanta,, GA 30309
USA

Phone: 678-884-0517
Fax: 678-884-0352
Email: meg391@comcast.net
WEB: http://www.mandaree.com

MECHANICAL ENGINEER, MECHANICAL DESIGNER

Brooke Ocean Technology Ltd. is a leading manufacturer of advanced marine equipment and instrumentation. We are about to open an office in New Bedford, Mass. and have immediate openings for the following positions:

Electrical Engineer - Robotics and Automation - position requires 5 years experience in automation and robotics and familiarity with electro-hydraulic systems. A marine background and experience with telemetry systems would be a definite asset. The successful candidate must have a bachelor's degree in electrical engineering or equivalent experience.

Jr. Mechanical Engineer - must have 2-5 years experience in the development of marine equipment and systems. The successful candidate must have a strong mechanical design background and be proficient with CAD software. Experience with hydraulic systems would also be an asset. The successful candidate must have a bachelor's degree in mechanical engineering or equivalent experience.

Mechanical Designer - must have at least 5 years experience in the design and manufacture, assembly and testing of marine hardware. The successful candidate should have hands on experience with hydraulic systems and be proficient with CAD software. You should have an associate's degree in mechanical engineering or equivalent experience.

Please e-mail your resume and salary history to Donna d'Entremont at ddentremont@brooke-ocean.com or fax to 902-468-1388.

No phone calls please.

We are an Equal Opportunity Employer. Only qualified applicants will receive consideration.

Donna d'Entremont
Brooke Ocean Technology Ltd

Fax: 902-468-1388
Email: ddentremont@brooke-ocean.com
WEB: http://brooke-ocean.com/

NAVAL ARCHITECT

Job Location: USA, LA New Orleans

Responsibilities:
- Running computer programs for hull calculations and structural analysis
- Check drawings
- Produce concept designs and specifications
- Produce detailed engineering deliverables
- As required, manage a team of engineers and designers to generate contract, functional and production engineering package through construction, vessel trials and warranty
- Prepare calculations including preliminary weight, performance, powering and range estimates.
- Develops new hull forms/lines, general arrangements and basic hull structural definition for concept designs
- Prepares technical reports and/or reviews technical data or reports provided by others as directed
- Performs and checks naval architectural calculations relating to floodable length, hydrostatics, stability or tonnage to assure conformity with applicable classification society, regulatory body or specification requirements. Performs other duties as assigned by management

Requirements:
- BSE in Naval Architecture and Marine Engineering
- 3+ years relevant experience
- Knowledge of exterior design desirable
- Familiar with USCG, DNV, LR, ABS, USN, and BV standards
- Extensive experience with AutoCAD and Microsoft Excel
- Experience with or willingness to learning modeling software such as Rhino preferred
- High degree of computer proficiency
- Good communication skills essential. Position involves coordination with regulatory agencies, clients, and production crew

J Giveans
A. K. Suda, Inc.
3004 19th Street
Metairie, LA 70002
USA

Phone: 5048351500
Fax: 5048311925
Email: hremail@aksuda.com
WEB: http://www.aksuda.com

NAVAL ARCHITECT / SALVAGE ENGINEER

Job Location: USA, CT Groton

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

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

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

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

General information regarding JMS can be found at http://www.jmsnet.com.

Blake Powell
JMS Naval Architects & Salvage Engineers
1084 Shennecossett Road
Groton, CT 06340
USA

Email: blake@jmsnet.com
WEB: http://www.jmsnet.com

NORWEGIAN CRUISE LINE -- ELECTRICAL ENGINEER

ELECTRICAL ENGINEER

Do you have S.T.Y.L.E.? NCL Got S.T.Y.L.E.!

Norwegian Cruise Line offers unique cruise vacations and delights their customers with friendly and efficient service from a dedicated, passionate team…all driven by the spirit of determination and innovation under the motto "Selling VACATIONS and delivering DREAMS".

Our customer service concept is called S.T.Y.L.E. Service Teamwork and Yes Lead to Excellence. As part of our STYLE-ish team, you must be able to provide the most enthusiastic, efficient and friendly service in every contact with every customer. All of our employees take pride in supporting and role modeling S.T.Y.L.E. If you have a "can-do" attitude, then you have S.T.Y.L.E!

We are currently seeking an experienced Electrical Engineer for our magnificent cruise ships with over 2200 passengers, and 900 crew members sailing all over the world and throughout the Hawaiian Islands year round and offering the best of Freestyle Cruising.

We are also accepting applications for 2nd and 3rd Engineers, Deck Officers, and Electronics Engineers. Email mmerino@ncl.com for IMMEDIATE consideration.

The Electrical Engineer's primary responsibility is to safely ensure the consistent, efficient operation of all electrical systems on board the ship.

POSITION RESPONSIBILITIES:
The duties and responsibilities of the Electrical Engineer include, but are not limited to:
- Must hold and Electrician Certificate and preferably have a High Voltage Certificate, if the ship is equipped with medium/high voltage system and other appropriate licenses and certificates as required by regulations.
- Familiarize himself/herself and understand the Diesel Electrical Propulsion system if the vessel is so equipped.
- Know all about the ships Emergency and

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

Safety Systems. Be familiar with the operation of the emergency generator and how to manual start if needed. Operation of the main switchboard, synchronizing of the generators, ability to bring power back to the ship after a complete blackout.
- Location of all the major distribution panels, in order to be able to shut down power in the event of a failure, i.e., fire and or maintenance work. Maintenance/repair of most common electrical problems that occur. The Electrical Engineer will work closely with the vessel's Engineer in solving electrical problems.
- The Electrical Engineer may be part of a watch going system on a rotational basis.
- The Electrical Engineer must familiarize himself/herself with the vessel's elevators/lifts. He/she may be required to attend the various elevator manufacturers training courses.
- Checking and maintenance of all electrical equipment as directed by the Chief Electrical Engineer.
- The Electrical Engineer must know first aid in case of emergency.

*Fluent in English; Speak, Read, Write

International Candidates:
Any employment offer for NCL is contingent on the ability of the applicant, candidate and/or new hire to successfully complete a police background check and a medical examination including drug screening. Candidates must also have a valid passport and possess the ability to obtain a C-1/D working visa prior to being assigned to a ship.
US Candidates:
*MMD/ Z Card Required
** All NCL engineers must become MEBA members. You do not need to be a member of MEBA to be considered for employment, however, if offerred a job, you must become a member to work onboard the ship. You may contact your local MEBA hall for details about becoming a member of the Union.

* Must have valid passport.

EDUCATION REQUIREMENTS:
Bachelor's Degree in Electrical Engineering or Equivalent High Voltage and Trouble Shooting Experience required.

Must hold all applicable licenses as required by maritime regulations.

PHYSICAL REQUIREMENTS:
- Able to lift at least 25 lbs.
- Climb on step stool or ladder in order to complete elements of job or facilitate maintenance issues.
- Bend, lean and stoop without hindrance.
- Fine motor skills.
- Use stairs often.
- Work within different temperature changes-indoors to outdoors.
- Able to pass basic safety course.
- All in here mentioned is a minimal description of duties.
- Other work requirements may be necessary and assigned as business or maritime law dictates.

Cruise Ship Employment:
Cruise ship employees live and work onboard for the duration of their contract. They work approximately 10 hours per day, 7 days per week. Shipboard assignments may last 4 to 10 months and can be followed by 1 to 2 months of vacation time. Assignment durations vary based on position.

Uniforms, accommodations and all meals are included. Transportation to and from the ship will be provided.

At NCL, we promise to value our team members, promoting a passionate and fun environment built upon respect, integrity and enthusiasm.

Additional NOTES:
Electrical Engineers needed for both our NCL and NCLA ships.
Rotations and compensation varies.
Several needed in August, September and October.

Generally rotations are 16 weeks on and 8 weeks off.

NCL ships sail all over the world.
NCLA ships sail the islands of Hawaii.

EMAIL MMERINO@NCL.COM WITH YOUR RESUME AND CONTACT INFORMATION FOR IMMEDIATE CONSIDERATION.

Visit our website at www.NCL.com for detailed voyage and employment information.

Maggie Merino
Norwegian Cruise Line
7665 Corporate Center Drive
Miami, FL 33126
USA

Email: mmerino@ncl.com
WEB: http://www.ncl.com

OFFERING INDONESIAN FISHERMAN

Job Location: Indonesia, Jakarta

Dear sir,
With hereby we would like to introduce our companies. Our company as the Crewing Agent mainly supplying Indonesian fisherman to foreign fishing vessel. We have intesive qualified experienced crew ready to join ship (Trawler, Longline Boat, Purseseiner, etc).

Please don't hesitate to contact us if you interest to recruit indonesian crew and please contact to the bellowe address :

Thank you for your good cooperation.

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VILLA MAS GARDEN BLOK A/15, PERWIRA
JAKARTA, BEKASI 17122, JAKARTA 17122
Indonesia

Phone:62-21-889798838
Fax: 62-21-8876430
Email: solomindodca@cbn.net.id

PORT ENGINEER-CLAMSHELL DREDGES

Job Location: USA, NJ

Weeks Marine, Inc., a leader in the Marine Construction & Dredging industry has an immediate opening for a Port Engineer. Qualified applicants must have a minimum of 5 years experience in the marine industry. Familiarity with hydraulic systems, A/C and D/C electrical systems, and hands on experience with diesel engines; the ability to travel frequently and strong computer and organizational skills also required.

We offer a comprehensive benefits package and salary commensurate with experience. Please send resume including salary requirements to:
WEEKS MARINE, INC.
Att: HR/Port Eng.
4 Commerce Drive
Cranford, NJ 07016
Fax: 908-272-3948
E-Mail: MAILHR@WEEKSMARINE.COM
M/F/D/V

Trish McSulla
Weeks Marine, Inc.
4 Commerce Drive
Cranford, NJ 07016
USA

Phone:908-272-4010 ext 2109
Fax: 908-272-3948
Email: MAILHR@WEEKSMARINE.COM

PROJECT MANAGER SHIP REBUILD US FLAG

Job Location: USA, CT Bridgeport

Plan, direct, organize and control the rebuild of the USS/USCGC Glacier in a shipyard yet to be selected. Candidate will hold advanced marine engineering degree, posess shipyard experience and have a proven track record of delivering projects on time and within budget.

This is a not for Profit charity enterprise which is currently working with 100% volunteer staff and suppliers. Funding is expected shortly and the project will move quickly from initial palnning to execution. We seek a qualified, highly motivated individual who is committed to deliver a rebuilt vessel that will accomplish the Charity's Mission: 1. Deliver Health Care in the Circumpolar Arctic Ocean Region. 2. Conduct Environmental Research & 3. Provide Education Services.

Successful candidate will posess the interpersonal skills to integrate himself into the existing volunteer and professional organization which has preliminary engineering and vendors selected.

Bernard G. Koether
Glacier Society
P.O.Box 1419
Bridgeport, CT 06601
USA

Phone: 203-380-3474
Fax: 203-386-0416
Email: bkoether@glaciersociety.org
WEB: http://www.glaciersociety.org

PROJECT/PROGRAM MANAGER

Job Location: USA, CA Santa Cruz

We are a manufacturer and systems integrator of Waterside Security Systems, Vessel Traffic Systems and a variety of video and radar surveillance systems in ports and harbor, dams and bridges and waterways around the world.

Requirement is for technical systems manager to work with sales and the customer to define the system then on contract to be responsible for all elements necessary to get the major items built (we sub-contract all manufacturing to a Contract Manufacturer in our building), then integrate and test the systems. To work with installation crews to see the equipment is installed properly, either through tech support or on-site support.

Current customers are USA west coast or in Middle East. Expansion to Gulf and East Coasts is emminent. Requires technical knowledge and experience with video, computers, data comm and maritime operations. Customers are port authorities, terminal operators, police and offshore terminals. Minimum 5-10 years hands-on experience in related system areas. West coast location. Some travel.

Rick Fay
Radar Digital Systems Inc
1 Victor Square
Scotts Valley, CA 95066
USA

Phone:831-440-9668
Fax: 831-401-2711
Email: rfay@radar-digital.com
WEB: http://www.radar-digital.com

PROPELLER TECHNICIAN

Job Location: USA, FL St. Petersburg

Metal finishing technician: To perform reconditioning services on marine propellers. Company specializes in the high performance boating industry. Will train the right person.

Julie Croce
Throttle Up Propeller
10611 Bay Pines Blvd. #1
St. Petersburg,, FL 33708
USA

Phone: 727-531-2255
Fax: 727-393-0292
Email: info@throttle-up.com
WEB: http://www.throttle-up.com

SALES ENGINEER, MECHANICAL

Job Location: USA, WA Seattle

Leading Winch System Engineering Firm and Manufacturer seeks a qualified Mechanical Engineer to assist the Sales Manager in the development of winch solutions, both oceanographic and workboat, for our worldwide customer-base. Past experience in winch engineering helpful but not mandatory.

Scott Kreis
Markey Machinery Company
4634 East Marginal Way South
Suite C140
Seattle, WA 98134
USA

Phone: 206-622-4697
Fax:
Email: skreis@markeymachinery.com
WEB: http://www.markeymachinery.com

SERVICE MANAGER

Job Location: USA, MA Marblehead

Hands on service person, organized, and well versed in all aspects of our growing service business.

Chris Hood
C. W. Hood Yachts, Inc.
3 Beacon Street
P. O. Box 443
Marblehead, MA 01904
USA

Phone: 7816310192

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Fax: 7816310345
Email: info@cwhoodyachts.com
WEB: http://www.cwhoodyachts.com

SUBMARINE MECHANICAL ENGINEER

Job Location: United Arab Emirates, Dubai

To supervise manned submarines construction, machinery design and assembly, HP air system piping, hydraulic transmission, diesel/electric engines installation, test diving, ISO 9001, bureau veritas.

Herve Jaubert
Exomos
Road 1120. Jebel Ali Port
Dubai, Dubai
United Arab Emirates

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

TECHNICAL SALES

Job Location: USA,

Sea-Bird Electronics, the world's leading manufacturer of CTD instrumentation has a Technical Sales opening for a mid-career professional.

The successful candidate will be self-motivated to quickly develop product and applications expertise, understand and adopt the company sales culture, become familiar with our customers and their needs, and increase sales. He/she will be very skilled in written and oral communication and enjoy engaging customers to communicate technical and scientific explanations, and develop a consultative rapport with customers. The candidate will posses sensitivity to culture and customer differences and the flexibility to work effectively with international end users, factory reps, resellers, and OEMs world wide.

Experience:
A satisfactory candidate will have approx. 8 years experience selling technically complex products to government and academic end users. He/she will have a degree and/or equivalent training and practical experience in electronics or engineering or a physical science, ability to make sales presentations to small groups and to train others.

It will be considered a plus if they have:

Knowledge of oceanography and oceanographic or water quality instrumentation, Degree in a Physical Science or Engineering,Knowledge of monitoring system applications, Foreign language skills, 2-3 years sales management experience.

Salary commensurate with experience. Send introduction cover letter and resume by email to dbennett@seabird.com

Thank you
Doug Bennett
Engineering Sales Manager

Sea-Bird Electronics, Inc.
1808 136th Place N.E., Bellevue, Washington 98005 USA
Tel: 425-643-9866 Fax: 425-643-9954
Vist our website at: http:// www.seabird.com

Doug Bennett
Sea-Bird Electronics, Inc.
1808 136th Place N.E.,
Bellevue, WA 98005

Phone:425-643-9866
Fax: 425-643-9954
Email: dbennett@seabird.com
WEB: http:// www.seabird.com

parting shots

COMING IN THE NOVEMBER 2005 EDITION

Feature
SeaFloor Engineering
Discovering and Recovering information from below the ocean requires increasingly advanced engineered systems and products. Profiled are the top five new developments in the works.

Product Report:
Salvage Vessels & Equipment

Directory
Underseas Vehicles & Imaging

Plus, BONUS DISTRIBUTION at:
- **The International Workboat Show,** Nov. 30 - Dec. 2, New Orleans
- **National Maritime Salvage Conference 2005,** Nov. 1-3, New Orleans,
- **Offshore Communications,** Nov 1 - 4, 2005, Houston, TX
- **Floating Production Systems 2005,** December 8-9, 2005, London, UK
- **35th Annual Conference of the Underwater Mining Institute** November 1-6, 2005, Monterey, CA

Advertiser's Index

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BP Thunderhorse Saved

BP's Thunder Horse semi-submersible platform, located in Mississippi Canyon Block 778 in the deepwater Gulf of Mexico, 150 miles southeast of New Orleans, is shown listing following the passing of Hurricane Dennis. While the platform was eventually righted, pictures of rigs in peril could be abundant in the wake of Hurricane Katrina, which swept ashore at press time and left a wide swath of damage in its wake.

Dress in Layers!

Increasingly the search for natural resources is leading to some of the earths most harsh areas. Severe weather conditions call for severe marine technology, such as this artist rendition of a new 70,000 dwt double acting Arctic shuttle tanker.
Aker Arctic Technology of Finland and the St. Petersburg based FSUE Admiralty Shipyards signed a contract for a license and design. The yard is building for ZAO Sevmorneftegaz for the Prirazlomnoye oil field in the Arctic Ocean.

EUROPORT MARITIME

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Wednesday	*2 November:*	*11.00 - 22.00 hours*
Thursday	*3 November:*	*11.00 - 22.00 hours*
Friday	*4 November:*	*11.00 - 18.00 hours*
Saturday	*5 November:*	*10.00 - 17.00 hours*

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