Moored Buoy Expansion in IOR • In Remembrance: David Porta

MARINE TECHNOLOGY REPORTER

July/August 2005
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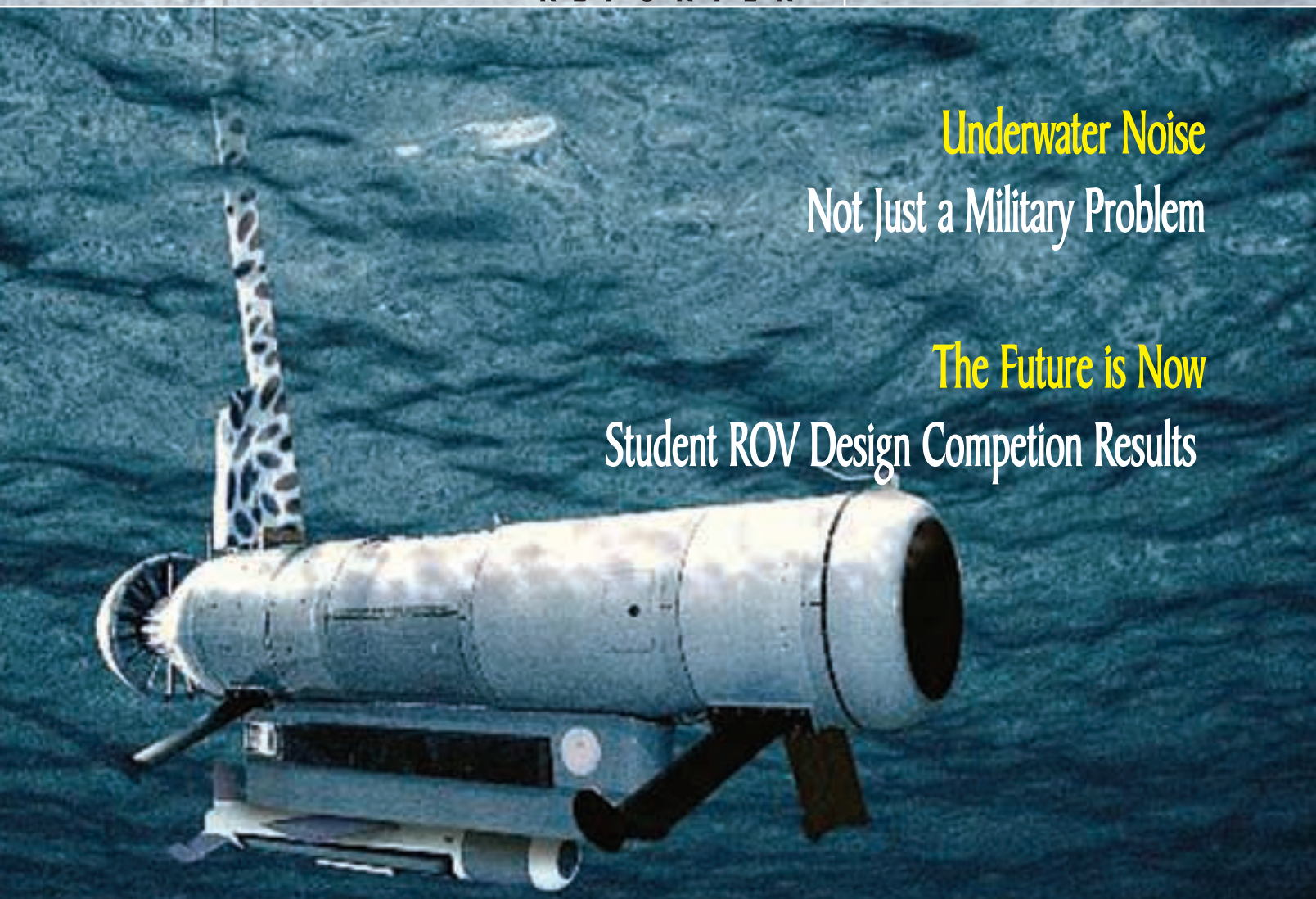

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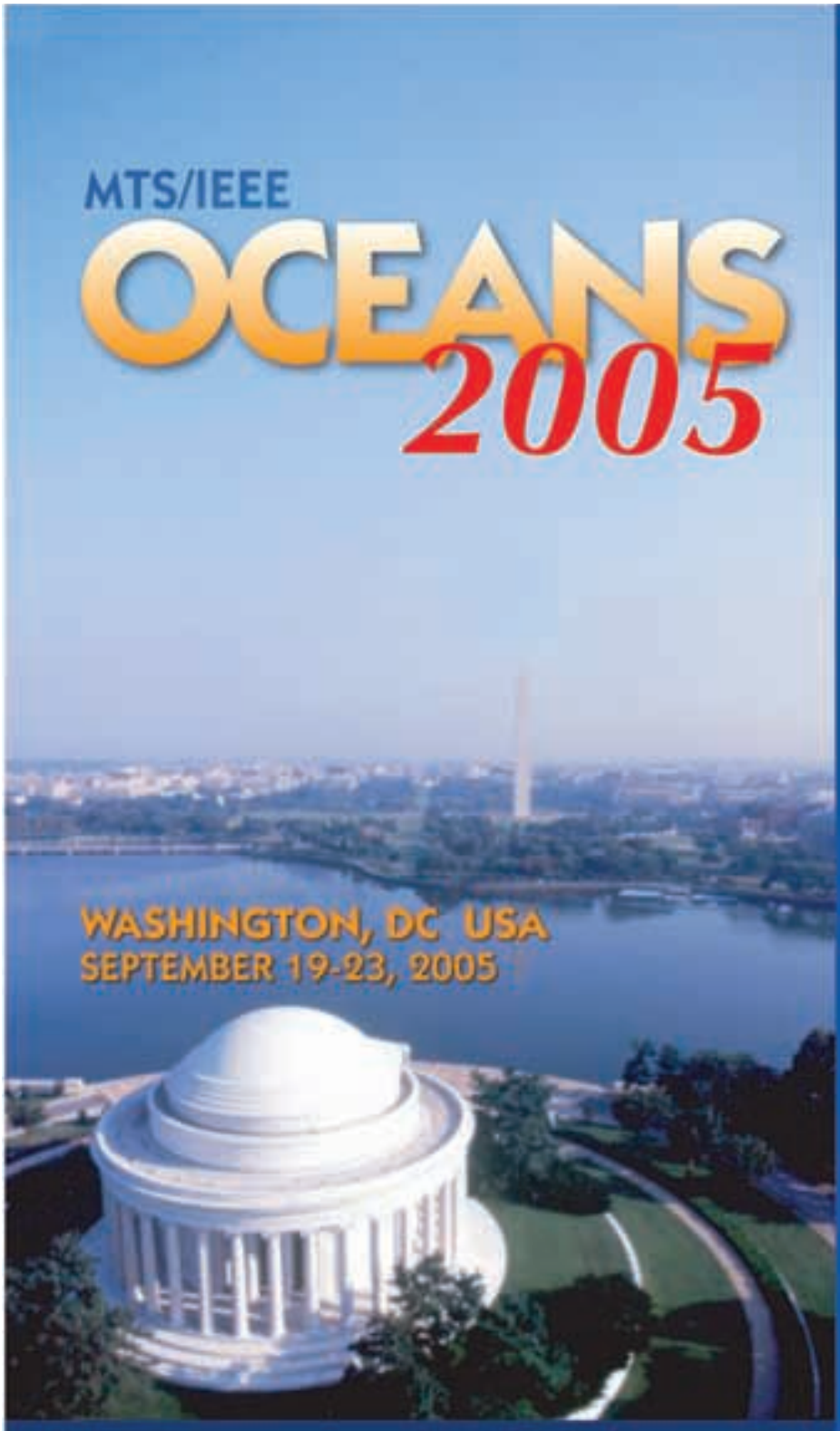

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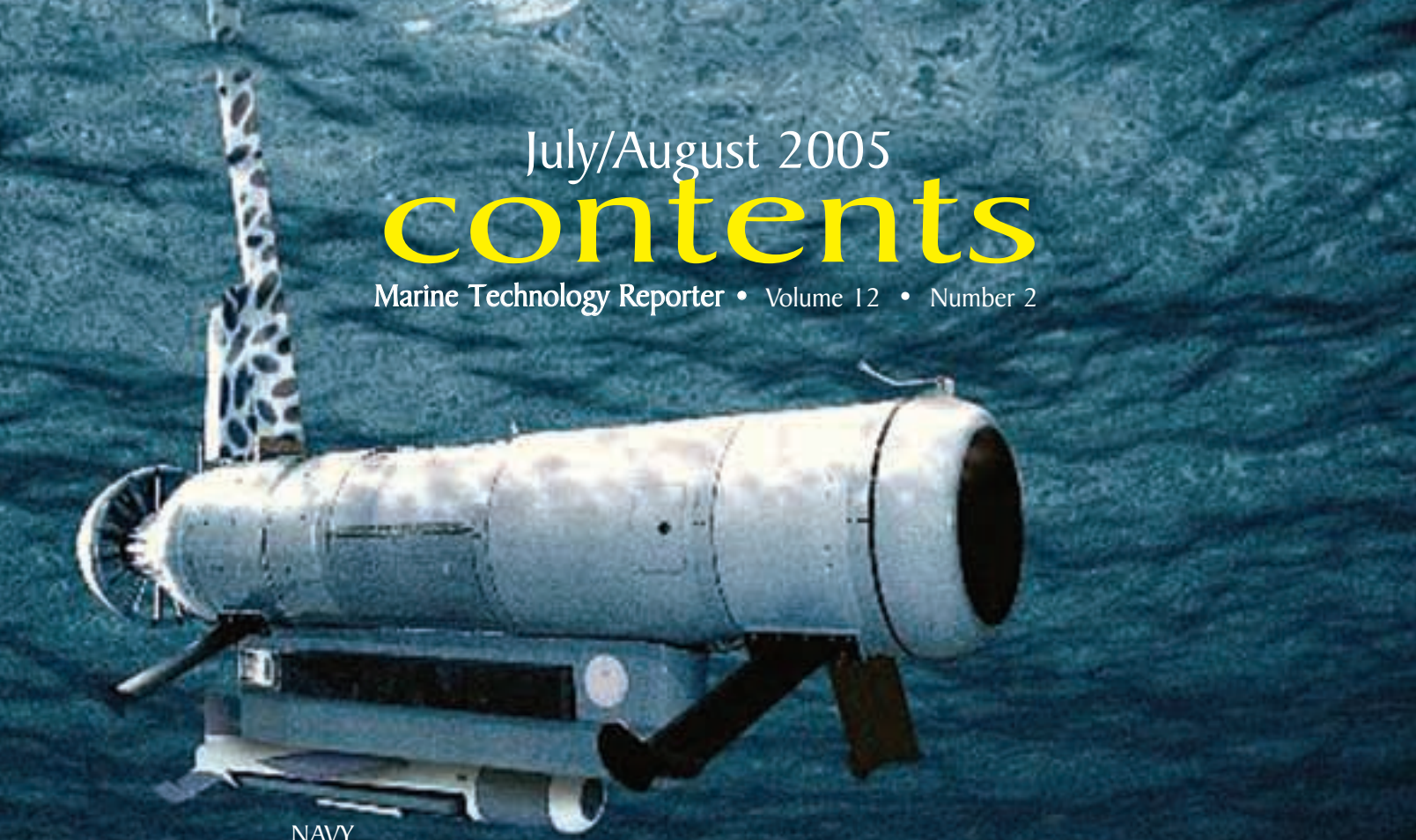

July/August 2005

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Marine Technology Reporter • Volume 12 • Number 2

on the Cover

Pictured on this edition's cover is the AN/WLD-1 Remote Minehunting System. The U.S. Navy, in its bid to develop a fleet of smaller, faster craft to command control of the littoral, is increasingly depending on Unmanned Underwater Vehicles (UUVs) as force multipliers and risk reducers. Edward Lundquist reports, starting on page 22.

(Photo Credit: U.S. Navy)

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 36)**

Edward Lundquist is a naval analyst and writer who lives in Springfield, Va. He is the communication director for the Center for Security Strategies and Operations, Anteon Corporation, Washington, D.C., and supports the Navy's Surface Warfare Directorate in the Pentagon. He served as a Captain in the United States Navy before retiring in 2000. **(Story on page 22)**

Michael Bahtiarian is currently the vice president of Noise Control Engineering in Billerica, MA, which specializes in shipboard noise and vibration control. He holds a B.S. & M.S. in Mechanical Engineering and is a Board Certified Acoustical Engineer. He has been involved with numerous shipboard noise control programs including NOAA FRV-40 and University of Delware's new R/V. **(Story on page 40)**

also in this Edition

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NOAA, Partners to Expand Tao Array

The array of moored buoys in the Pacific that helps predict El Niño events is being expanded into the Indian Ocean to help improve the understanding of the climate system in that region. Scientists from NOAA are working with international scientists to develop a plan for such a system. VAdm. Conrad C. Lautenbacher Jr., of NOAAm said, "Such an array will move us closer to a Global Earth Observation System of Systems to help us fill gaps in our knowledge of Earth's climate system." Five buoys have been deployed through funding by NOAA's Office of Climate Observation in cooperation with India's National Institute of Oceanography and Department of Ocean Development (Dona Paula, Goa, India). Another NOAA buoy is slated to be deployed in November. Three additional buoys were deployed by Japan's Agency for Marine-Earth Science & Technology (JAMSTEC) (Yokosuka, Kanagawa, Japan). Officials expect that seven will be deployed by 2007. Additional buoys will be guided by international plans and future budgets. Plans envision a total of 39 buoys when the array is completed. Leading NOAA's effort is Michael McPhaden of NOAA's Pacific Marine Environmental Laboratory here and director of the Tropical Atmosphere Ocean (TAO) array in the Pacific. The array was renamed TAO/TRITON in 2000 to reflect contributions by Japan.

TAO buoy and support ship in Pacific. (Photo courtesy of NOAA)

Cod Fishery Declines 96% on Scotian Shelf

Once a dominant species, the volume of cod on the Scotian Shelf plunged 96% since the 1850s, according to landmark research published recently by the Census of Marine Life (part of the Consortium for Oceanographic Research & Education). Writing in Frontier's in Ecology, researchers announced the first-ever estimate of cod levels in the 1850s, created using old schooner catch records and observations, coupled with modern modeling tools.

Researchers said their findings have profound implications for contemporary policy makers trying to rebuild fishery "remnants" and restore the marine ecosystem.

In recent debates in New England over management of George's Bank and Gulf of Maine cod stocks, for example, many argued that 1980s stock levels should be considered fully rebuilt.

However, "this contradicted the evidence of basic cod biology, which suggested that cod stocks would only be rebuilt at higher levels," the researchers said.

Using a mathematical formula, the researchers estimate cod biomass on the Scotian Shelf was 1.26 million metric tons in 1852, compared with less than 50,000 metric tons today.

The adults within represent 3,000 metric tons or 6%.

The study also noted the estimate of 1850 cod biomass is "quite conservative" as the old fishing logs only record adult cod.

Learn more at www.coml.org/medres/medres77.htm.

Scientists Find Hidden Dangers to Passing Ships

Using inflatable boats, a portable depth sounder with GPS, and a REMUS autonomous underwater vehicle, a team of scientists and engineers has created the first detailed, comprehensive chart of the ocean floor around Palmer Station in Antarctica, revealing previously unknown submerged rocks.

The new chart, the first in 50 years, was made by a research team from the Woods Hole Oceanographic Institution (WHOI) and the University of Southern Mississippi over five weeks in April and early May as they looked for sites for a new underwater observatory.

Their findings revealed a number of previously unmapped submerged rocks, among them a set of sharp rocky pinnacles that are potential navigational hazards. Some rise nearly 100 m (about 330 ft.) to a depth of six meters (about 20 ft.) below the surface and near to the routes generally taken by ships through the area.

The previous nautical chart of the area was produced in the mid 1900's by single soundings taken at very wide spacing. Although some underwater hazards were marked on the earlier chart, the old chart was found to be incorrect by at least 0.5 nautical miles.

Since Palmer Station was first established as a scientific outpost in 1965, ships have followed a particular route through the visible rocks.

In typical marine navigation in poorly charted waters, ships new to the area proceed cautiously, making continuous soundings with their bridge fathometer. They then note their routes on charts and follow the same routes when entering and departing the area.

Palmer Station is one of three U.S. research stations on the continent and the only station north of the Antarctic Circle. Named for American sealer Nathaniel B. Palmer, who in 1820 was one of the first to see Antarctica, the station was built in 1968 to replace the prefabricated wood huts of 'Old Palmer' station, established in 1965.

Gallager, Asper and their team went to survey the sea floor around Palmer Station to locate possible sites for the installation of the first underwater cabled observatory in Antarctica.

The Polar Remote Interactive Marine Observatory (PRIMO) will be equipped with sensors to monitor ocean properties during an entire year.

It will be installed in the Austral fall of 2006 about two nautical miles to the south of Palmer Station on the ocean bottom at a depth of approximately 130 m (425 ft.), connected by a fiber-optic and electrical cable to a newly constructed building at Palmer Station.

Instruments, including current meters, plankton imaging systems, and an under ice video observation system, will travel up and down through the water column throughout the day from the observatory's base to just below the surface, even after the pack ice forms and covers the area.

Proximity sensors on the top of the profiling platform will send and receive acoustic signals to prevent it from contacting the ice. The scientists hope to use this first observatory as a proof of concept and test-bed for a similar observatory to be located in deeper water.

"Protection of the cable and underwater platform from grounding icebergs at depths of 100 m (330 ft.) or greater is a major concern, and the primary reason for needing the detailed underwater maps, but finding the rocks was an unexpected bonus of the trip," said Gallager.

"The real challenge now is to design and build a platform that will survive the harsh Antarctic winters in the water and provide us the first ever long-term, high resolution glimpses of what is going on in this region of the Southern Ocean."

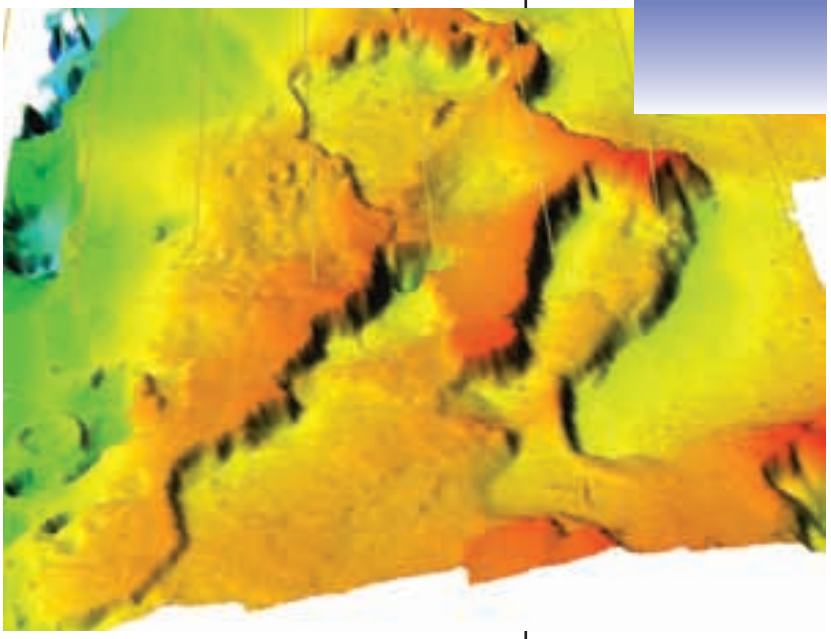
Did You Know?

CO2 is Turning Oceans Acidic

Britain's Royal Society is warning that carbon dioxide is turning the oceans acidic. Depending on the rate of fossil fuel burning, the pH of ocean water near the surface is expected to drop lower by 2100 than it's been in the last 420,000 years. See "British Scientists Say Carbon Dioxide Is Turning the Oceans Acidic," Kenneth Chang, The New York Times, 7/1/05 (www.nsnet.com)

EM 710S Echosounder Passes Navy Tests

The newest Kongsberg Maritime AS multibeam echosounder received high marks in initial sea trials onboard the Royal Navy ice patrol ship, HMS Endurance. Kongsberg's Freddy Pøhner said the EM 710 multibeam echosounder (CW pulse version) is a high- to very-high-resolution seabed mapping system that can be tailored to user requirements, allowing for choice of beamwidths as well as transmission modes. Minimum acquisition depth is from less than three m below its transducers, and the maximum acquisition depth is up to 2,000 meters. Swath width is up to 5.5 times water depth or 140° to a maximum of more than 2,000 meters. Endurance patrols and surveys the antarctic and South Atlantic, maintaining close links with the U.K. Hydrographic Office and the British Antarctic Survey. She is due to return to Portsmouth later this month, with final EM 710S performance trials planned in mid-July.



New Underwater Volcano Found Near Samoa

An international team of scientists, led by researchers at the Woods Hole Oceanographic Institution (WHOI), Scripps Institution of Oceanography, University of Oregon and University of Sydney, discovered an active underwater volcano near the Samoan Island chain about 2,400 miles southwest of Hawaii.

During a research cruise to study the Samoan hot spot, scientists uncovered a submarine volcano growing in the summit crater of another larger underwater volcano, Vailulu'u.

This new volcano, dubbed Nafanua after the ferocious Samoan goddess of war, did not exist just four years ago, according to co-chief scientists Stan Hart, a geochemist at WHOI, and Hubert Staudigel, a geologist at Scripps Institution of Oceanography. With a growth rate averaging eight inches per day, the volcanic cone has rapidly formed since the scientists' last expedition to this area in May 2001. Nafanua now stands at 300 m, or nearly 1,000 ft.

"To actually have a documented case of an underwater volcano that has been constructed within a known period of time is very rare-this is one of those cases," said Hart.

Scientists were tipped off to the volcano's existence when they profiled the seafloor of the Vailulu'u crater using multi-beam mapping. Maps of the seafloor in the area gave little indication that this volcano existed.

When sound beams were directed into the crater this time, they measured an unusually shallow depth. These interesting results prompted further investigation of the area using the manned submersible Pisces V-a seven-foot sphere that can to dive to more than 6,000 ft., operated by NOAA's Hawaii Undersea Research Laboratory.

The water surrounding the volcanic cone is extremely turbid due to hydrothermal activity and the vigorous vents that produce this volcanic "fog" are obscured, according to Staudigel.

Although visibility from the submersible was less than 10 ft., the researchers were able to observe the unique biological community surrounding the newly formed volcanic cone.

Much of Nafanua is covered with yellow "fluff," microbial aggregations that are produced by microscopic life feeding on chemical energy from the volcano's hydrothermal system.

As this international team explored the area, they discovered a number of large communities of eels inhabiting the fragile cavernous rock pillars surrounding the hydrothermal vent area.

As the submarine landed near this area, scores of eels, each approximately one foot long, emerged from the rock caves and crevices.

The scientists named this novel marine hydrothermal community "Eel City."

Three students from High Tech High in San Diego were aboard one of the two expeditions to Nafanua and assisted researchers in collecting and analyzing data.

These students also created and maintained an in-depth Web site related to the cruise where they posted reports, maps, photos and videos from submersible dives. Also, the students and scientists aboard the ship participated in the first ever student-to-student videoconference between a high school and a research vessel with the help of HiSeasNet, a satellite communications system that provides continuous Internet connectivity for oceanographic research vessels at sea.

Did You Know

that undersea earthquakes and volcano eruptions generate noise levels in the 250 to 260 dB @ one meter range? For more information on underwater noise, see the article "Underwater Noise: Not Just a Military Problem", starting on page 40 of this edition.

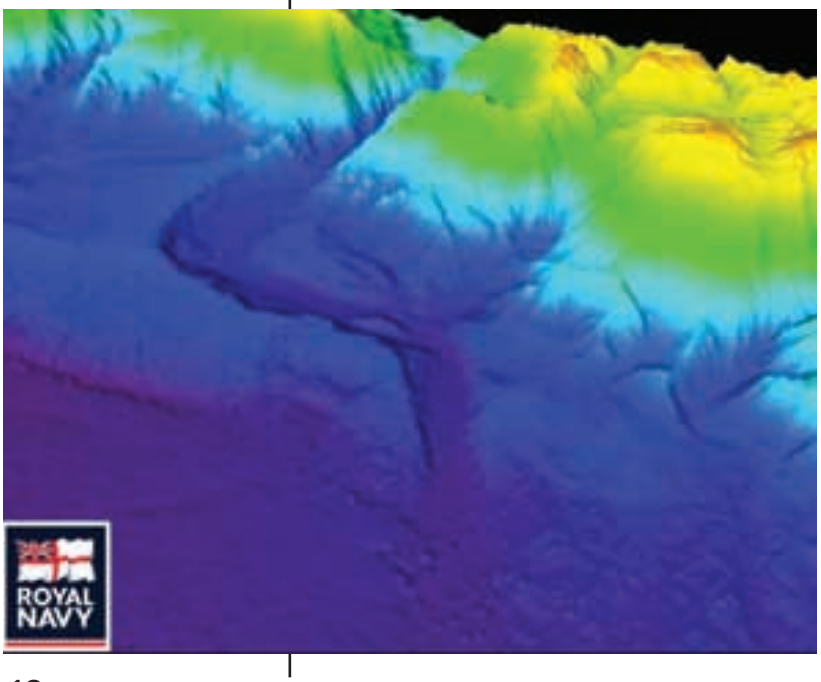
One-Stop Shop for Subsea Vehicle Components

A new business alliance will allow users to purchase subsea vehicles, vehicle components, and control systems from a single source. Schilling Robotics LLC and Scotland's Sub-Atlantic Ltd. will pool resources for sales, service, product development, and marketing, according to a joint statement. Colin Millum, Sub-Atlantic's joint managing director, said the alliance "Offers ROVs, tether management systems, communication and control systems, electric and hydraulic manipulators, tool skids, electrical and hydraulic thrusters, hydraulic power units, valve packs, compensators, pan and tilts, rotary and linear actuators, and cable/connector assemblies." Tyler Schilling, Schilling CEO, added that "By pooling the technical expertise of both companies, the alliance can enhance current products and create new ones more quickly and efficiently."

For more information visit www.maritimeequipment.com/mt & Click No. 64

Seafloor Maps of Tsunami Earthquake Zone

A multibeam echosounder system, jointly developed by the U.S. Navy and SeaBeam Instruments Inc. more than ten years ago, provided the world with its first images of the ocean floor near the epicenter of the Asian tsunami. The SASS IV system installed aboard the U.K. Navy's oceanographic survey vessel, HMS Scott, is a low-frequency, high-resolution sonar system that collects and processes seafloor depth data over a wide swath, in near real time. Following the December 26, 2004 quake, the Scott deployed to the area and collected bathymetric data. The data were then used to create 3-D images that scientists are still evaluating to further their understanding of the earthquake and assist in the prediction of such events in the future. The SASS seafloor images, recently released by the U.K. Ministry of Defense, show enormous "scars" more than 6 miles wide and newly formed ridges up to 1,500 meters (4,950 feet) high that were thrust up when the India tectonic plate collided with and pushed underneath the Burma plate.



The SASS IV is an ocean mapping system used by both the U.S. and U.K. navies to survey deep-ocean areas around the globe. SeaBeam Instruments was contracted by the Navy to design and deliver major components of the SASS systems in the 1980s and 1990s. In 1999, SeaBeam was acquired by L-3 Communications and is currently a product division of L-3 Communications Klein Associates of Salem, New Hampshire.

For more information visit www.maritimeequipment.com/mt & Click No. 65

USS Monitor Replica Under Construction

Northrop Grumman, The Mariners' Museum, the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Navy have teamed to construct a full-scale replica of the Civil War ironclad USS Monitor. The replica will be the centerpiece of the $30 million USS Monitor Center at The Mariners' Museum in Newport News, Va. More than 100 employees of Northrop Grumman's Newport News sector will build the replica in 22 steel sections inside the shipyard's steel production facility from Navy-donated materials. Construction of the ship's hull is scheduled to be complete by the end of 2005. The sector's Apprentice School recently completed the first section, the keel unit. Weighing approximately 18 tons and about the size of a rail car, the keel unit was transported to the USS Monitor Center earlier this years for a public keel-laying ceremony.

Northrop Grumman Newport News employee Josh Cantrell welds the keel section of the USS Monitor replica in preparation for a Mar. 6 keel laying ceremony.

"We are proud to be a part of this special project and to have the opportunity to rebuild a piece of history that our employees, their families and the entire Hampton Roads community can visit and learn about for many years to come," said Mike Petters, president, Northrop Grumman Newport News. Nancy Petters, Petters' wife, served as keel authenticator for the ceremony by chalking her initials onto a metal plate. Her initials will then be welded onto the plate and permanently affixed to the Monitor replica. Since 2000, Northrop Grumman Newport News employees have volunteered their help and expertise to the Monitor recovery project by off-loading artifacts at shipyard piers and docks, constructing conservation tanks at The Mariners' Museum and performing topographical ultrasonic inspections and X-rays of the recovered items. The sector also made a $250,000 contribution to the USS Monitor Center Capital Campaign in 2004.

C&C Hosts AUV Users' Conference

The first AUV Users' Conference sponsored by C&C Technologies attracted worldwide participants from the oil & gas industry, as well as government agencies. Held April 12 - 14, 2005 at Big Cedar Lodge near Branson, Mo., it was intended as an opportunity for autonomous underwater vehicle (AUV) manufacturers, integrators, and customers to explore opportunities for the advancement of AUV technology. The forum included technical papers and panel discussions interspersed with social activities that promoted an exchange of ideas and sharing of experiences between a diverse group of AUV advocates. Presentation topics included advances in AUV sensor technology, seismic data collection with an AUV, military applications for AUVs, HSE risk assessment, and the use of AUV data for exploration. Capabilities and sensor performance parameters of C & C's new C-Surveyor II AUV were also presented.

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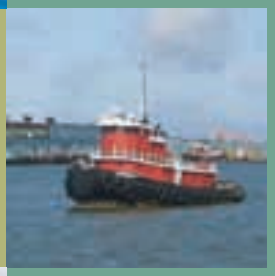

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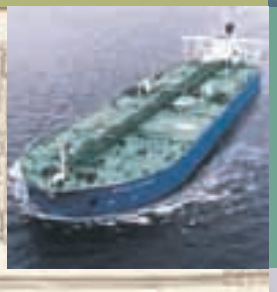

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SubSea 7 Orders New Offshore Construction Vessel

Merwede Shipyard received a contract to design and build a Reeled Rigid Pipe laying/Offshore construction vessel for Subsea 7. The pipe laying equipment will be designed and built by Huisman Itrec. Delivery of the vessel is scheduled for 2Q 2007. SIEM, through its subsidiary Subsea 7, signed contracts for a new rigid pipelay and construction vessel. The overall project cost is in the $180-$200 million range and is based on fixed prices from Merwede Shipyard and the pipelay equipment supplier. The ship will be a fully Dynamic Positioned Reeled Rigid Pipe laying/Offshore Construction Vessel, suitable for worldwide operation. The vessel is designed for reeled rigid pipe laying and offshore construction work. It will have a 6.6 kV integrated electric power generation system, and propulsion by three electro-motor driven fixed pitch propellers in azimuthing nozzles aft. Two retractable Azimuth thrusters will be fitted in the forward part of the vessel; one transverse thruster will be arranged in a tunnel forward.

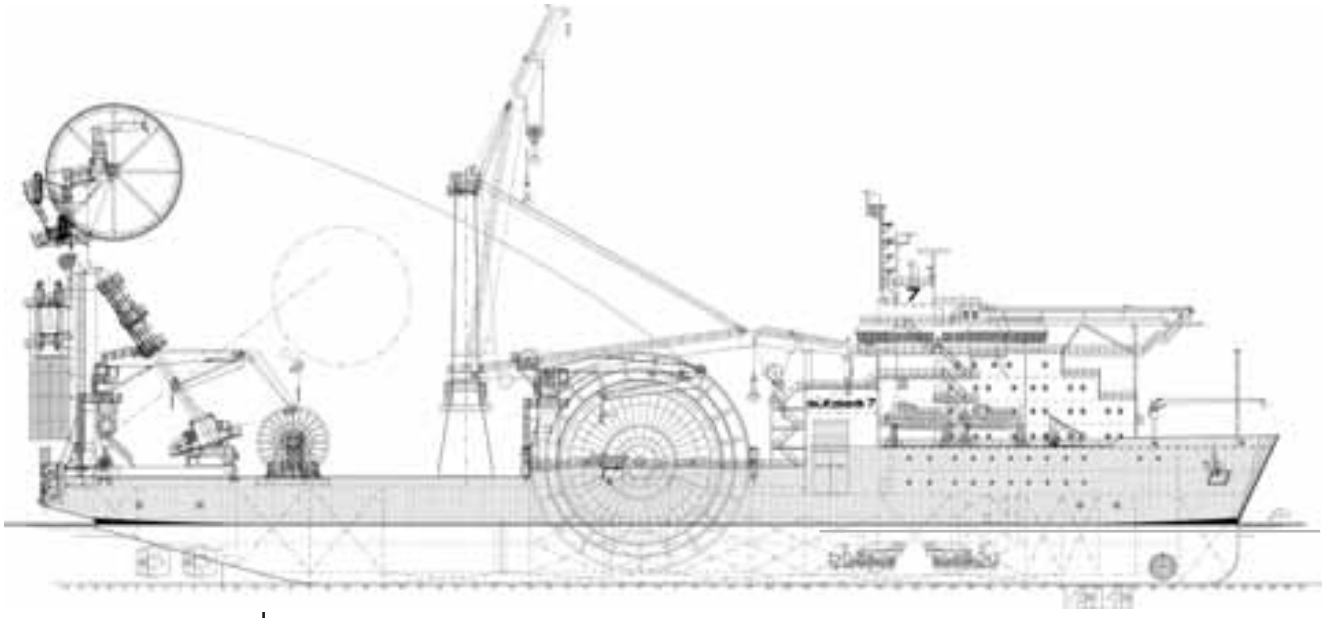
A full width ROV hangar will be located after of the accommodation block. Vertical ROV deployment rails will be fitted in the ship's sides port and starboard. A large 400 MT offshore crane will be located on the port side of the vessel amidships. Two other large offshore deck cranes will be located one on the starboard side at the forward end of the main working deck and one on PS at the aft end of the main working deck.

Aft of the main pipe lay reel, a clear deck area of at least 650 sq. m. will be arranged. A pipelay ramp will be located at the aft end of the ship. Cantilevered work platforms will be provided at each side of the transom at main deck level.

For more information visit www.maritimee-quipment.com/mt & Click No. 66

Main Particulars

Length, o.a.	(157.1 m)
Length, b.p. on design draft	(138. 3 m)
Breadth, molded	(28.40 m)
Depth, maindeck mld.	(12.5 m)
Draft, design mld.	(7.5 m)
Draft scantling mld.	(8 m)
DWT (incl. Payload) at design draft approx.	10,930
DWT (incl. Payload) at scantling draft approx.	12,430
Ship's complement	120 berths
Classification	Lloyd's Register of Shipping



Merwede Shipyard will build this new Reeled Rigid Pipe Laying/Offshore construction vessel for Subsea 7.

ERAPSCO Wins $10M Deal

ERAPSCO, Columbia City, Ind., is being awarded a $10,125,000 firm-fixed-price contract for AN/SSQ-101 sonobuoys and associated data. The AN/SSQ-101 sonobuoys are dropped from various airborne platforms and used for search and detection of submerged submarines. Work will be performed in Columbia City, Ind. (50%) and DeLeon Springs, Fla. (50%), and is expected to be completed by April 2007. Contract funds will not expire at the end of the current fiscal year. The Naval Surface Warfare Center, Crane Division, Crane, Ind., is the contracting activity.

QinetiQ System to Norway

QinetiQ signed a contract worth more than $5 million for the supply and ongoing support of its LOKI torpedo countermeasures to the Royal Norwegian Navy. These reportedly will form part of the Norwegian Navy's integrated torpedo defense suite on its new Fridtjof Nansen-class frigates. A spokesman explained that LOKI is a maintenance-free, expendable torpedo, countermeasure system designed as a defense against acoustic-homing torpedoes.

Sonardyne Dataloggers

FMC Kongsberg Subsea (Kongsberg, Norway) placed an order with Sonardyne for four acoustic data logger systems for use on the Greater Plutonio field offshore Angola. A spokesman said that advances in acoustic technology from Sonardyne are now enabling the use of downhole instrumentation over prolonged periods with reservoir data being recovered quickly and efficiently via wideband acoustic telemetry. The equipment will be deployed on subsea wellheads in around 1,500 meters water depth and will store and relay data from downhole pressure and temperature gauges. The data loggers feature Sonardyne's new Fusion wideband technology, which is designed to allow large volumes of data to be rapidly retrieved at the surface via acoustic telemetry. Sonardyne acoustic data logger systems are depth rated to 3,000 m and can be deployed, connected to downhole instrumentation, and then later recovered entirely by ROV.

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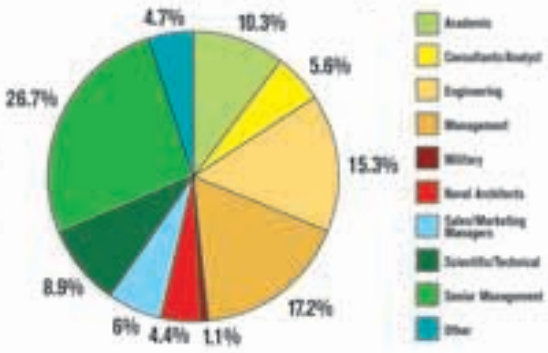
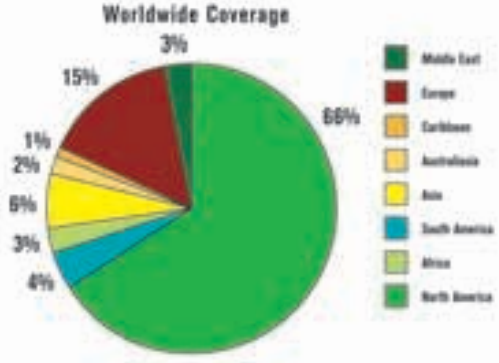


Worldwide Coverage



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- **57%** requested additional information from an advertisement or editorial.

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

• BONUS DISTRIBUTION •

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

• BONUS DISTRIBUTION •

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

★BONUS DISTRIBUTION★

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:

Underwater Cameras & Lighting Systems

DIRECTORY:

Electronic Charting & Vessel Management

★BONUS DISTRIBUTION★

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

★BONUS DISTRIBUTION★

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.

PRODUCT REVIEW:

Diving

DIRECTORY:

The MTR 2006 Annual Directory

★BONUS DISTRIBUTION★

Posidonia 2006 June 5-9, Athens, Greece

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:

The MTR 200

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.

PRODUCT REVIEW:

Undersea Vehicles & Imaging

DIRECTORY:

Communications, Telemetry & Data Processing

July 2006

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

FEATURE:

Underwater Defense: Port & Harbor Security

Maintaining the security of aquatic borders is top priority for homeland defense. Read how government, industry and academia are cooperating to this end.

PRODUCT REVIEW:

Offshore Oil & Gas Production

DIRECTORY:

Undersea Defense Products

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Offshore Northern Seas 2006 Aug. 22-25, 2006, Stavanger, Norway

Coming in *Marine Technology Reporter* • 2005/2006

September 2006

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

FEATURE:

The Ocean Engineering Edition

In conjunction with SNAME in Ft. Lauderdale, MTR presents some of the most innovative concepts on the drawing board around the world.

PRODUCT REVIEW:

Salvage Vessels & Equipment

DIRECTORY:

Deck Machinery, Ropes, Cables & Connectors

★BONUS DISTRIBUTION★

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

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

U.S. Maritime Security Expo Sept., New York, NY

October 2006

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

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November 2006

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

FEATURE:

Deep Ocean Exploration

From discovering natural resources to diving shipwrecks to exploring the earth's crust, MTR explores innovative uses of tried methods and new technologies in studying the deep ocean.

PRODUCT REVIEW:

Power Systems and Products

DIRECTORY:

Ports & Harbors

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International Workboat Show December, New Orleans

What do *Marine Technology Reporter* readers buy?

Anchors & Mooring Systems	39.2%
Aquaculture Systems	9.5%
Atmospheric Diving Systems	7.1%
Autonomous Underwater Vehicles (AUV)	35.2%
Buoyancy Under Materials	18.1%
Buoys	48.0%
Cables & Cable Connectors	50.7%
CAD/CAM	59.5%
Calibration Services	45.5%
Chemicals and Coatings	25.4%
Control Systems	34.2%
Current Meters	39.5%
Data Acquisition Systems	32.5%
Deck Equipment	50.7%
Deck Machinery/Electrical Equipment	28.1%
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This is the AN/WLD-1 Remote Minehunting System. (U.S. Navy image)

UUVs

Force Multiplier for Navy

By Edward Lundquist

The U.S. Navy will be depending upon unmanned systems to serve as "force multipliers" and "risk-reducers" according to the service's Unmanned Underwater Vehicle (UUV) Master Plan. The goal of the master plan is to identify the most promising UUV technology and accelerate the delivery of those capabilities to the fleet.

One objective of the plan is to develop systems with the highest degree of autonomy to allow for long, complex and covert missions. The document establishes the service's UUV investment priorities.

The UUV Master Plan defines four classes of UUVs, categorized by size and application:

Man Portable Vehicles: Generally less than 100 lbs and are designed to be launched from surface craft, small boats shore. Two people can usually lift one of these UUVs. These vehicles are used for missions of relative short duration (10 to 20 hours) and are often expendable. They serve in the intelligence, surveillance and reconnaissance (ISR), mine location and neutralization, explosive ordnance disposal (EOD) and communications relay missions.

Lightweight Vehicles (LWV): Fit the standard 12.75-in. diameter lightweight torpedo dimensions and can be launched by aircraft and surface combatants. LWV systems can be used for harbor ISR; oceanographic purposes; serve as a node in a communication and/or navigation network (CN3) and mine reconnaissance. LWVs usually weigh between 100 and 500 lbs.

The Heavyweight Vehicle Class: Includes systems in the 3,000 lbs category that can be launched from the 21-in. diameter heavyweight torpedo tube found on submarines. They are employed for ISR, oceanography, clandestine mine countermeasures (MCM) reconnaissance and as submarine decoys.

The Large Vehicle Class: Has the greatest payload capability and endurance. Large UUVs can travel covertly 100 miles or more to reach an operating area and then remain

Chief Aerographer's Mate James W. Wassmer, assigned to Commander Mine Warfare Command, Unmanned Underwater Vehicle (UUV) Detachment, on board High-Speed Vessel Swift (HSV 2), monitors a side scan sonar image from a Battle-Space Preparation Autonomous Underwater Vehicle (BPAUV) following the first night-time launch of the vehicle. BPAUV's are small, fast, underwater robots, that maps the ocean bottom near the shore, detect changes in inshore conditions, and hunt mines. Swift participated in exercise Rim of the Pacific (RIMPAC) 2004. RIMPAC was the largest international maritime exercise in the waters around the Hawaiian Islands. The exercise included seven participating nations; Australia, Canada, Chile, Japan, South Korea, the United Kingdom and the United States.

(U.S. Navy photo by Photographer's Mate 2nd Class Richard J. Brunson)

on station for a week or more. Vehicles of this class will weigh up to ten tons and can be launched from submarines, including the Navy's SSGN. These vehicles have the greatest power requirements, so the navy is investigating a variety of new propulsion technologies. These large systems are used for persistent ISR, ASW "hold-at-risk" missions; long-range oceanography and various payload delivery missions.

By allowing systems to be in more places at the same time, UUVs become a force multiplier. They are uniquely capable to operate in the undersea environment for extended periods. They offer the utility of placing or removing objects or sensors; conducting bottom surveys; gathering, transmitting or relaying information as well as performing reconnaissance of the underwater battlespace. The Navy seeks the attributes that UUVs can provide, because they can operate in difficult environments while removing the human element from high-risk situations.

The Navy already uses a variety of UUVs for mine-countermeasures. The Littoral Combat Ship will rely heavily on UUVs and other unmanned systems for its focused missions of anti-surface warfare, anti-submarine warfare and mine warfare. UUVs will play an increasingly important role in finding and destroying targets on the bottom, in the water column and on the surface. They can serve in critical oceanographic roles by collecting bathymetric data; acoustic information; bottom profiles; current, temperature and salinity data; and conducting chemical/biological/nuclear detection.

The master plan calls for setting standards for common systems, interfaces, and mission planning, operating and control systems. New systems must be "open" and compatible with others. Common systems, such as control, sensors, or batteries, are desired and mission systems will be modular so a UUV can be configured to conduct a variety of different mis-

sions as needed.

While UUVs are unmanned, human factors are definitely involved in the deployment, control and recovery of these systems. Human Systems Integration (HSI) will be addressed with all unmanned systems. The Navy requires that future UUV operating and logistics requirements are efficient and practical for the warfighter. Constant operational control of systems is neither necessary nor desirable. Preprogrammed UUV missions will provided with the appropriate information to make independent decisions and determine appropriate courses of action. Power and propulsion are concerns. Today, small UUVs can complete missions with batteries available on the market. The larger systems of the future will require new technology solutions for complex missions of the future. Larger systems are using air independent propulsion, fuel cells, or high-energy batteries, such as lithium batteries. (Some lithium batteries are extremely expensive to procure and cost a great deal more to dispose of.)

The plan readily admits that using unmanned systems greatly reduces risk to personnel in hostile environments. UUVs extend the sensor range of host platforms, and allow the host platform to "be in more places than one." Also, systems operating within the undersea environment have a distinct advantage in searching for submarines, mines, or other objects within the medium.

The plan foresees unmanned underwater systems that contain prepositioned weapons caches that can be clandestinely placed close to potential targets allowing for quicker response times without leaving a "flaming datum" exposed to counterattack.

The plan calls for increased experimentation to try out new systems and new uses for existing systems.

By working closely with other unmanned vehicle programs to achieve economies of scale and standardization, experimentation and testing will determine and validate the most effective applications.

"Transformation applies to what we buy as well as how we buy and operate it - all while competing with other shifting national investment priorities," the report says.

Edward Lundquist is a senior technical director for the Center for Security Strategies and Operations with Anteon Corporation. He supports the Navy's Surface Warfare Directorate.

Crewmen assigned to Commander Mine Warfare Command, Unmanned Underwater Vehicle (UUV) Detachment prepare to launch a Battle-Space Preparation Autonomous Underwater Vehicle.

(U.S. Navy photo by Photographer's Mate 2nd Class Richard J. Brunson)

AUV Launched from Bermuda to Cross Gulf Stream

A small autonomous underwater vehicle (AUV) named Spray was launched in late March about 12 miles southeast of Bermuda. The two-meter-long orange glider with a four-foot wingspan is expected to slowly make its way northwest, crossing the Gulf Stream and reaching the continental shelf on the other side, before turning around and heading back to Bermuda where it will be recovered in July. WHOI's Shelley Dawicki said the voyage would be the vehicle's second trip across the Gulf Stream.

Spray made history last fall as the first AUV to cross the Gulf Stream, but this time it is making the trip from the other direction. The 112-pound vehicle was launched by researchers from the Woods Hole Oceanographic Institution near a long-term research site known as Station S. Scientists Breck Owens from WHOI and Russ Davis and Jeff Sherman of Scripps Institution of Oceanography at the University of California/San Diego will track its progress and to communicate with the vehicle via satellite during the mission to change course or alter the information it is collecting while at sea. Spray has a range of about 3,500 miles, which means it could potentially cross the Atlantic Ocean and other ocean basins. Owens, Davis, and Sherman plan to send the vehicle on its first round trip between Woods Hole and Bermuda later this year, marking another first for an underwater vehicle.

Nova Ray ROVs

Nova Ray, Inc. offers a line of ROV's for survey, inspection and security applications. All models incorporate the patented arcuate (bow) shaped wing design. The arcuate shaped wings of the Nova Ray are designed to counteract the lifting force of the umbilical, to reduce the effects of boat speed and current on the operational stability. The wings are also designed to increase cable use efficiency and reduce the amount of cable necessary to operate or tow at depth.

For more information visit
www.maritimeequipment.com/mt & Click No. 34

Solar-Powered AUV

Technology Systems Inc., in partnership with the Autonomous Underwater Systems Institute (AUSI) and Falmouth Scientific, Inc. (FSI), is producing a Solar-powered Autonomous Underwater Vehicle (SAUV).

The new SAUVs is designed to offer unlimited mission endurance and independent operation. Programmed to self-charge on the surface after each 12-hour dive, SAUVs do not require a support ship. The SAUV is designed for long-term monitoring of ocean sanctuaries and estuaries, other offshore coastal areas, and harbors. It can be equipped with sensors to meet individual customer requirements. FSI is manufacturing the new vehicles. TSI provides computer graphic user interface (GUI) to the vehicle and operational support. AUSI is providing the high level mission manager software system as well as assisting with customer requirements and technical guidance to the team.

For more information visit
www.maritimeequipment.com/mt & Click No. 6

New MicroWing For ROV

ROVeXchange, LLC based in Oregon, is now distributing the patented arcuate (bow) shaped MicroWing conversion kit, which is designed to be used on the VideoRay underwater remotely operated vehicle (ROV) for towing and high current operations. The MicroWing is a scaled down version of the larger observation or general class ROV, The Nova Ray. The creators of the patented arcuate shaped wing, Nova Marine Exploration, Inc. based in Kirkland, Wash., came up with the idea to create a mini MicroWing conversion kit for the VideoRay in hopes they could better aid military, government, and law enforcement agencies in their quest for safer waters and effective rapid response.

For more information visit
www.maritimeequipment.com/mt & Click No. 9

NRC Canada Chooses Gavia AUV

The Canadian Research Council has placed an order for a Gavia AUV to fulfil their requirement for a multi mission capable Autonomous Underwater Vehicle. The NRC plans on using their Gavia in two main applications: an inspection vehicle for potable water pipes and a test bed vehicle for newly developed sensors and actuators, free-swimming experiments and hydrographic mapping in lakes and oceans.

For more information visit
www.maritimeequipment.com/mt & Click No. 27

DeepOcean Offers Phantom ROV

The Phantom 150E from DeepOcean is a portable ROV designed for potable water and NDT inspections, small retrieval in confined areas and for rugged use in interactive exhibits. Phantom XTL owners can operate the 150E using their existing console and an intermediate Power Management Box.

For more information visit
www.maritimeequipment.com/mt & Click No. 30

C-Surveyor II AUV Delivered

C&C Technologies' deepwater AUV, C-Surveyor II, was delivered to C&C's corporate headquarters in Lafayette, La., in early June. C&C purchased the C-Surveyor II as a base vehicle in November 2004 and has worked to integrate and build customized components for it. The design of the C-Surveyor II is modeled after C&C's existing AUV, C-Surveyor I, and includes a multibeam echosounder, chirp side scan sonar, chirp sub-bottom profiler, CTD system and a methane detector. The Edgetech DW106 sub-bottom profiler on board is customized with narrow transmit and receive beams to permit significantly deeper seabed penetration. In addition to the sub-bottom profiler, C&C also has a Dynamically Focused (DF) sidescan sonar system being specialized for installation in November 2005. The DF sidescan sonar will provide five times more resolution than traditional systems in order to

Royal Norwegian Navy Orders Second Hugin 1000 AUV

The Royal Norwegian Navy (RNoN) is following up the successful first phase of the Norwegian Mine Reconnaissance Program (HUGIN MRS) by placing an order with Kongsberg Maritime for another HUGIN 1000 AUV. The HUGIN MRS Program is being developed in several phases with technology, concept development and field evaluations in progress since 1998. This stage of the program included a number of HUGIN operations by the RNoN throughout 2002 and 2003, mobilizing one of the existing HUGIN AUVs onboard the Norwegian mine hunter HNoMS Karmoey. These operations resulted in successful demonstrations of the HUGIN AUV in military operations. The RNoN placed an order for the first HUGIN 1000, a dedicated AUV for military operation, early in 2004. HUGIN 1000 is operated from the RnoN mine hunter, HNoMS Karmoey, and has been successfully deployed in several NATO exercises and in NATO's Immediate Reaction Force MCMFORNORTH(1) from autumn 2004. Equipped with side scan or synthetic aperture sonar, multibeam echo sounder, and an integrated inertial navigation system, HUGIN AUVs are designed to provide high quality, high resolution imagery and bathymetry with excellent position accuracy. The next HUGIN 1000 for the RnoN will be equipped with the HISAS 1030, a high resolution Interferrometric Synthetic Aperture Sonar developed in co-operation between Norwegian Defence Research Establishment (FFI) and Kongsberg Maritime. The vehicle endurance will also be extended by adding more modules of the pressure tolerant Lithium Polymer battery developed for the first HUGIN 1000 AUV.

For more information visit
www.maritimeequipment.com/mt & Click No. 80

identify smaller objects located on the ocean floor. At press time, C&C system engineers were integrating proprietary hardware and software into the C-Surveyor II AUV. Upon completion, the C-Surveyor II will be mobilized on the company's 247-ft. Norwegian flagged vessel, M/V Northern Resolution, and begin several surveys.

For more information visit
www.maritimeequipment.com/mt & Click No. 81

SeaEye Wins Major China Order

China has placed its first order with Seaeye Marine for a Panther Plus ROV. The system will be supplied for free-swimming operations with interfaces pre-installed to accept an upgrade for future TMS operations. News came

after two years of negotiation by Seaeye with a subsidiary of the China National Offshore Oil Corporation, (CNOOC). This order is for the 15th Panther to be built by Seaeye for the oil and gas industry. The unit's stated high maneuverability is achieved with a combination thrust of 220 kg forward and 170 kg lateral through eight vectored brushless DC thrusters operating in pairs. Integrated drive electronics with velocity feedback are designed to give precise and rapid control of the vehicle. The ROV will be fitted with a five-function and a six-function manipulator, video and survey suite with the surface equipment provided ready to install into a locally manufactured control cabin.

For more information visit
www.maritimeequipment.com/mt & Click No. 82

Ten Remus AUVs to UK Royal Navy

Britain's Royal Navy is opting to go autonomous. Hydroid Inc. announced here that the firm recently received a multiyear contract from the U.K. Ministry of Defense for 10 REMUS autonomous underwater vehicle (AUV) systems. Hydroid's vice president of marketing, Kevin McCarthy, said, "Hydroid has teamed with QinetiQ Ltd. (Farnborough, Hampshire, U.K.) and Babcock Design & Technology Ltd. (Merstham, Surrey, U.K.) on the MOD contract. QinetiQ will provide logistic and service support, using its expertise in UUV technology to maintain and service the vehicles and its waterside trials facility for training, testing and acceptance. Phil Jenkin, U.K. Mine Countermeasures Equipment IPT of the Defense Procurement Agency, said, "REMUS will enable the Royal Navy to undertake rapid mine reconnaissance in the very shallow water (VSW) zone an area which, currently, is accessible to divers only. Employing REMUS will reduce the risk to clearance divers during operations in the detection and clearance of maritime mines."

For more information visit
www.maritimeequipment.com/mt & Click No. 83

Quest from Schilling Robotics

The QUEST UHD from Schilling Robotics is an ultra-heavy-duty work-class ROV with power pack options of 100, 150, and 200 hp. The system can be used for ultra-heavy tasks such as suction pile installation, flying lead installation, and other applications that benefit from redirecting power from propulsion to tooling operations. Key benefits, according to the manufacturer, include:

- Increased usable power: The vehicle can produce an unmatched combination of vertical and horizontal thrust. For example, unlike many ROVs, the QUEST UHD can not only lift a flying lead, but can maneuver while carrying the load.
- Power redirection: Operators can direct full system power to tooling or propulsion as required.
- In-frame space: The vehicle's large size and compact components provide significant open-frame space for payload and/or tooling.
- Depth options: The system can be easily upgraded from the standard 3,500 m up to 6,500 m.
- Superior control: The UHD uses advanced intelligence for automatic control modes (heading, depth, altitude, attitude and StationKeep).

For more information visit
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Oceaneering

Flying Eyeballs & Busy Hands

By Larry Pearson

The headline aptly describes the main functions of Remotely Operated Vehicles, or as they are more popularly known, ROVs. One of the largest manufacturers and suppliers of these advanced technology products is Oceaneering International, Inc., generating annual revenues of about $781 million with 5,100 employees at 56 locations in 20 countries. Oceaneering International is an applied technology company operating in the oil and gas, telecommunications and aerospace industries, with headquarters in Houston and a training center and manufacturing base is in Patterson, La.

As divers are unable to operate below 1,000 ft. of water depth, ROVs have become an indispensable necessity for many commercial and military applications, particularly adept at serving the modern oil and gas exploration, drilling, well completion, inspection, maintenance and repair projects.

"We operate approximately 170 ROVs worldwide from our own fleet of ships, drill and production rigs and on vessel fleets such as Tidewater and Chouest," said Jay Yager, Oceaneering ROV commercial manager. "Most of our ROVs are rated for at least a working depth of 10,000 feet," Yager added. "Typically a customer who thinks he has a subsea problem will send down a full working class ROV, not a flying eyeball," Yager said. (A flying eyeball is an ROV that can observe, not perform subsea work.) "It doesn't make sense to send down one ROV to confirm a problem that you are pretty sure you have and another to

An ROV under construction at the Oceaneering facility. Two ROVs can be built simultaneously in this area.

The Ocean Intervention, a very capable ROV support vessel with two moon pools, a heavy duty ROV, DP2 system and a 6,000 square foot rear deck.

fix it," said Yager.

The top class ROV is the Maxximum series, which has a center lift capacity of nearly 2,000 pounds and forward pivoted bollard lift capacity in excess of 1,800 pounds. "This unit is designed for deepwater drilling work and field development projects," said Darryl Rundquist, senior ROV operations manager.

The Maxxium series has a direct fiber optic link between the ROV and the operator, a link that delivers video for deepwater operations and wide bandwith for sensors and survey equipment.

Oceaneering has three other work class ROVs: Millennium Plus, Millennium and Magnum, with 225, 150 and 100 HP ratings respectively.

The Minimum ROV is a "flying eyeball," is used for projects that require inspection only. These units can be mounted to a work class vehicle in support of ROV operations with a second ROV system.

Work class ROVs are enclosed in cages that offer protection during launch and recovery. The cages are open on one side so the ROV can move out of its cage to perform the actual subsea work. "Most of our ROVs work is within 600 feet of the cage, but there have been projects that required the cage and ROV to be separated by as much as 3,200 feet," Rundquist added.

Lights, camera, action. This ROV carries several cameras and lights so the operator gets a clear picture of the work being done. Two work arms are at opposite sides of the photo.

The ROV system includes the ROV and its cage, a control van for operator control and a second van that serves as a workshop. "Often we have to reconfigure the ROV to meet customer needs and job requirements such as torque tools, dredging equipment, wire cutters, suction pile pumps and a variety of customer-driven and/or developed tooling," Rundquist said. "Crews maintain these systems to meet high Oceaneering and customer equipment standards. That work is all done in the workshop at sea or on the rig or platform," Rundquist said. "The only limit to the ROV is the human mind as we have overcome many obstacles in support of subsea work in the oil patch."

ROVs are able to be outfitted and capable of multiple tasks, such as drilling, threading pipe, installing subsea trees and their valves, setting concrete mattresses (protection for pipelines where they cross), just to name a few applications. They have also proven valuable performing Inspection, Maintenance and Repair (IMR) work. ROVs are employed for drill support, construction projects and completion, an oil industry term for installing jumpers and trees. "ROVs are also invaluable at accident sites where airplanes, boats or other objects sink to the bottom of a body of water," said Yager. "They may be used for aircraft debris field inspection or in a work mode to assist in the recovery of the object," Yager added. A special class of ROVs called the Magellan was specifically developed for this type of work.

Manufacturing

"One of the advantages of our ROVs is that they are made by our company. We stock all repair parts and custom configure each unit and its cage to the needs of the project, or the customer " Rundquist said. In April, Oceaneering was building two new ROVs along with their cages, both headed to projects in Africa. Along with the actual ROV, the company builds and stocks the control vans and workshops that are a part of every ROV installation.

A newly completed Millennium Series ROV.

The main classroom in the Patterson, La. Training Center. The instructor is on the raised platform where simulations are run on the consoles manned by the students.

At the Patterson facility were several of these units, some stacked with the control room above the workshop, a useful configuration for installations on boats where deck space is a premium.

Training

Oceaneering International is dedicated to training those who operate, rig and maintain ROVs, stressing that basic safety is a top priority, according to Nick Gallien, Gulf Coast Division training manager. "All new hires must complete a five day basic safety course as a prerequisite to Oceaneering International employment," Gallien said. "It includes Health, Safety and Environment (HSE) training for two days, a one day water survival course, basic rigging

A student troubleshoots an electrical assembly on an ROV.

concepts for one day and a day course in CPR/AED blood borne pathogens and first aid.

Training for ROV operators is extensive and revolves around work in the Training Center, shipboard training and a 150-unit technical module study course available on CD-Rom as well the Internet.

"Our Training Center utilizes simulators that are tied into the same basic equipment found onboard ship or on a rig or drilling platform," Gallien said. "Much like aircraft simulator training, we can change the parameters, such as current, visibility and other factors to give students a real world training experience," Gallien said.

The main training area features a raised platform and several monitors, allowing an instructor to teach the student working at the three operator's stations basic and advanced ROV operations. "One of the training stations is tied into an actual ROV which is used in the large water tank in our outside area," Gallien said. "Using this station, students operate an actual ROV, not an on-screen simulation."

The heart of the training program is the rotation the student makes between the Training Center, onboard working ROV installations and the CD-ROM course work. All students are assigned a mentor who guides the students through both basic and advanced ROV practices.

"We typically hire students with high electrical and mechanical aptitudes, not necessarily people with prior ROV experience," Gallien said. "Good hand-eye coordination is also important for ROV operators as well as the discipline to work in harsh environments."

The Training Center is staffed with five instructors and three administrative personnel, and a typical week includes teaching 50-75 people in classroom-based courses, as well as more than 500 students in the distance-based learning series.

Oceaneering Vessels

Oceaneering International owns and operates seven specialized vessels for ROV support, diving support as well as a Floating Production Storage and Offloading (FPSO) vessel in Africa, the Ocean Producer.

Its primary vessels are Ocean Intervention and Ocean Intervention II, both equipped with a ROV and twin moon pools, and both DP-2 rated with large rear decks to carry construction equipment and tools. They are equipped to handle almost any subsea project including umbilical installations, flowline development, pipeline repairs; subsea tiebacks mat installations and a variety of subsea inspection IMR projects. Ocean Service also offers ROV support and IMR work along with DP-1 dynamic positioning capability.

While Oceaneering International is the largest ROV company in the world, it also offers diving and diving support vessels for shallower water installations. Ocean Quest, Ocean Inspector and Ocean Project are set up for diving support work.

A new cage for an ROV. The cage and its ROV will be going to Africa.

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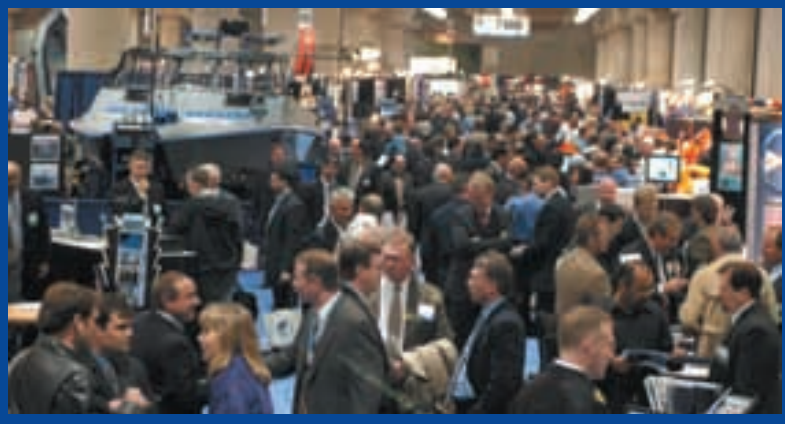

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A Bright Future

Student ROV Design Competition

By Maggie L. Merrill, Editorial Consultant Member MOTN & MTS

It was a rainy Saturday in April, but the energy inside the pool house at University of Rhode Island (URI) was far from dreary. More than 150 energetic high school students, teachers, parents, judges and URI students were preparing to compete in the 2005 MATE ROV New England Regional Design Competition. Nine teams from all over New England were busy setting up posters, ROVs and staging areas for the day's events.

Sounds of duct tape pulling off rolls, PVC pipes being sawed or drilled and students talking quietly with the judging panel so as not to tip off the nearby competition of their trade secrets created the buzz in the pool room. Smells of chlorine mixed with glue being applied to pesky underwater seals to ensure instruments were kept dry swirled around the top level.

This was the fourth New England Regional competition. The first two were held in Cambridge: one at MIT and the other at the Cambridge Rindge and Latin School. The events were held at URI for the past two years. These events are completely organized by students. Head Judge Brennan Phillips ran the URI event last year when he was a senior. He served this year as head judge as a graduate student at University of Connecticut. URI senior, Ashley Bonaventure, ran the event at URI this year. In the case of the college locations, the Student Chapters of the Marine Technology Society performed all the organization, fund raising and event coordination. Having students run these events is so important, say Brennan Phillips. "It is a great way for college students to interact with high school students and for all concerned to work with industry representatives. Other student chapters of MTS have expressed

The South Kingston High School team displays its innovative Leviathan ROV L-R Michael Gobell (12th grade); David Casagrande (10th grade); Casuarina Hart (10th grade)

interest in hosting the 2006 event." The mission of this four-year-old event is to inspire high school students to design, build and operate remotely operated underwater vehicles. Each year, the students are given a set of tasks to accomplish. At the regional events across the country, all teams competed in the Ranger Class event. The Ranger ROVs had to accomplish three specific tasks: cap an oil well in the Gulf of Mexico, repair a damaged fiber optic cable connection to reestablish a communications link, and install a new instrument module on the Hubble space telescope. At the national level, there are two classes of competition: regional winners compete in the Ranger class event and more experienced teams compete in the Explorer class event. There is no qualifier to compete in the Explorer class, as it is significantly more challenging. The Explore ROVs must simulate being deployed from a satellite to investigate the possibility of water on one of Jupiter's six moons, Europa. The tasks required were to re-establish the communications to the scientific package; retrieve data probes located within a drawer on the science package; collect a sample of red fluid from a crevice; and measure the temperature of the venting fluid.

The design parameters are noted in detail on the official MATE web site at www.marinetech.org. There was also an engineering briefing hosted by the Stellwagen Bank Marine Sanctuary in Scituate, Massachusetts to answer questions about the competition and provide potential contestants and sponsors with an opportunity to meet.

The first step in the competition was for the student teams to present their vehicle to the engineering judges. Each team explained in detail the process of forming a team, designing the ROV, fund raising, mentor seeking and testing their ideas to a team of engineering judges. Combined with that was the presentation of their technical report, which the engineering judges scored, while another team of judges judged the posters. The final test for the teams was the in-the-water portion. In the end, the top two scoring teams were cross-judged to ensure there was no bias.

Meet Some of the Teams

School	**High Technology High School**
Location	**Lincroft, New Jersey**
Rank	**First**

The team from School High Technology High School in New Jersey — comprised of freshmen, sophomores, juniors and seniors — performed very well, finishing first overall. The fact that the team finished first on its first underwater robotics project may come as a surprise to some, but they have completed in other land based robotics events before. Also, the school's focus in science and engineering, and its students are selectively admitted. The course was a full year course culminating in this competition. The team's ROV completed all missions, and overall there were no surprises. The team's mentor is Bill Wetzel, a former AT&T executive and an electrical engineer by training. The team scored 3rd on the engineering presentation; 2nd on the poster; 1st (by a large margin) on the in-the-water missions; and 1st on the report.

Plymouth North High School team leader, Andrew Browning operating their vehicle. The control station is set back from the pool's edge so the vehicle is 100 percent controlled remotely.

School	**South Kingstown High School**
Location	**Kingstown, RI**
Rank	**Fifth**

The South Kingstown High School team is comprised

The entire High Technology High School team await Poster Judges.

of four boys and one girl. One of the team members explained their roles; Casuarina Hart said she did a lot of the written work as well as work with the sealing wax. She said, "we are all Math Club kids, writing isn't our thing, so I was elected to write the report". In most cases teams took this on as an extra curricular activity; in lieu of participating in a sport.

This crew named their vehicle, Leviathan. The team designed a closed, solid vehicle — mimicking a torpedo — making it more streamlined to maximize speed. They spent much design time optimizing thruster placement to maximize hydrodynamic flow. Leviathan was unique in this competition with the use of four thrusters, as the team determined it afforded more accurate control of pitch, roll and yaw.

Being typical high-schoolers with diverse schedules, the team split specific tasks and, all told, it took this team about eight weeks to finish. The team had a great mentor in Walt Hudson, who retired last year from the school, but he came back to help with this project. He assisted faculty member Steve Picotte, the Robotics and Wood shop instructor. South Kingstown High's team completed two of the three in-the-water tasks; ranked 3rd on its technical report; ranked 3rd on its poster; and ranked 4th on its engineering presentation.

School **Plymouth North High School**
Rank **Sixth**

Senior Andrew Browning lead a team of 20 students ranking from freshmen to seniors enrolled in a full-year robotics class at Plymouth North High School which regularly competes in other land based robotics competitions, but never before a marine-related event. Faculty advisor, Mike Bastoni said, "we will definitely do this next year." They invested this year in learning the ropes, and intentionally crafted a younger team so they would have experience for next year's competition. Bastoni feels it is appropriate for the public school to focus on developing marine technologies since Plymouth is located right on Massachusetts Bay. Ironically, despite the team's aquatic proximity, it had a terrible time gaining access to a pool to test its systems. The team's sponsor was ENTERGY, the company which operates the Pilgrim Nuclear Power Plant. The team interested ENTERGY by showing the company that the ROV they designed could also be used to inspect inside nuclear fuel containment vessels. PNHS scored 1st in engineering; 2nd on the poster; and 7th in the water mission.

Results from NE Regional ROV Competition

Team Name	Engineering & Comm		Mission	Report	Total	Rank
	Engineering	Poster	Score	Score	Score	
High Tech	**45.2**	**16**	**139.1**	**21**	**221.3**	**1**
Milton	24	14.15	125.7	15	178.85	2
North Kingstown H.S.	52	13.82	109.8	0	175.62	3
Cambridge Rindge & Latin	26.6	16.88	109.2	14	166.68	4
South Kingstown H.S.	45	14.47	88.1	17	164.57	5
Plymouth N.	60.5	16.9	46	9	132.4	6
Sound School	43	10.03	48.4	18	119.43	7
ELMS	41	14.1	26	3	84.1	8
ELHS	39	4.5	14	8	65.5	9
Cranston	0	0	0	11	11	10

What the Judges had to say

Dr. Robert Tyce, said of the ROV competition, “this is really a great place to meet potential candidates for our program right here at URI. We would like to interest these high school students to pursue a college program such as our Underwater Robotics program here at the university. I was very impressed with the level of the teams this year as compared to last year. They are much better prepared."
Tyce said that the Leviathan vehicle designed by the team at South Kingston High School was very innovative. He said it is a cross between an ROV and an AUV, and was the only solid vehicle in the competition. It looked very much like an AUV, but it had standard ROV components such as external thrusters and a camera. There was also a battery pack which powered the camera, which saved power for the thrusters. Matt Naiman, of the WHOI Deep Submergence Group said, "this is much better than last year's competition. Many have benefited from competing last year. Also, I think the race preparation seminar hosted by Stellwagen Bank Marine Sanctuary really helped the teams. The result was that every vehicle operated."

Chief Judges
Matt Naiman (Woods Hole Oceanographic Institution)
Brennan Phillips (University of Connecticut/ Institute for Exploration)

Pool Competition Judges
Craig Bussel (National Undersea Research Center: North Atlantic/Great Lakes); Dennis Arbige (University of Connecticut Marine Sciences) cadet from mma name?; Dr. Matthew Loomis (Mass Maritime Academy)

Engineering Judges
Dr. Robert Tyce (URI Ocean Engineering)
Katy Croff (URI/GSO); Chris Voorhis (URI Ocean Engineering)
Jim Case (University of New Hampshire/ MTS New England)
Eric Martin (URI Ocean Engineering);Mike Tash (URI Ocean Engineering)

Poster Judges
Anne Smrcina (Stellwagen Bank National Marine Sanctuary)
Maggie L. Merrill (***Marine Technology Reporter)***; Ryan Smith (Mass Maritime Academy)

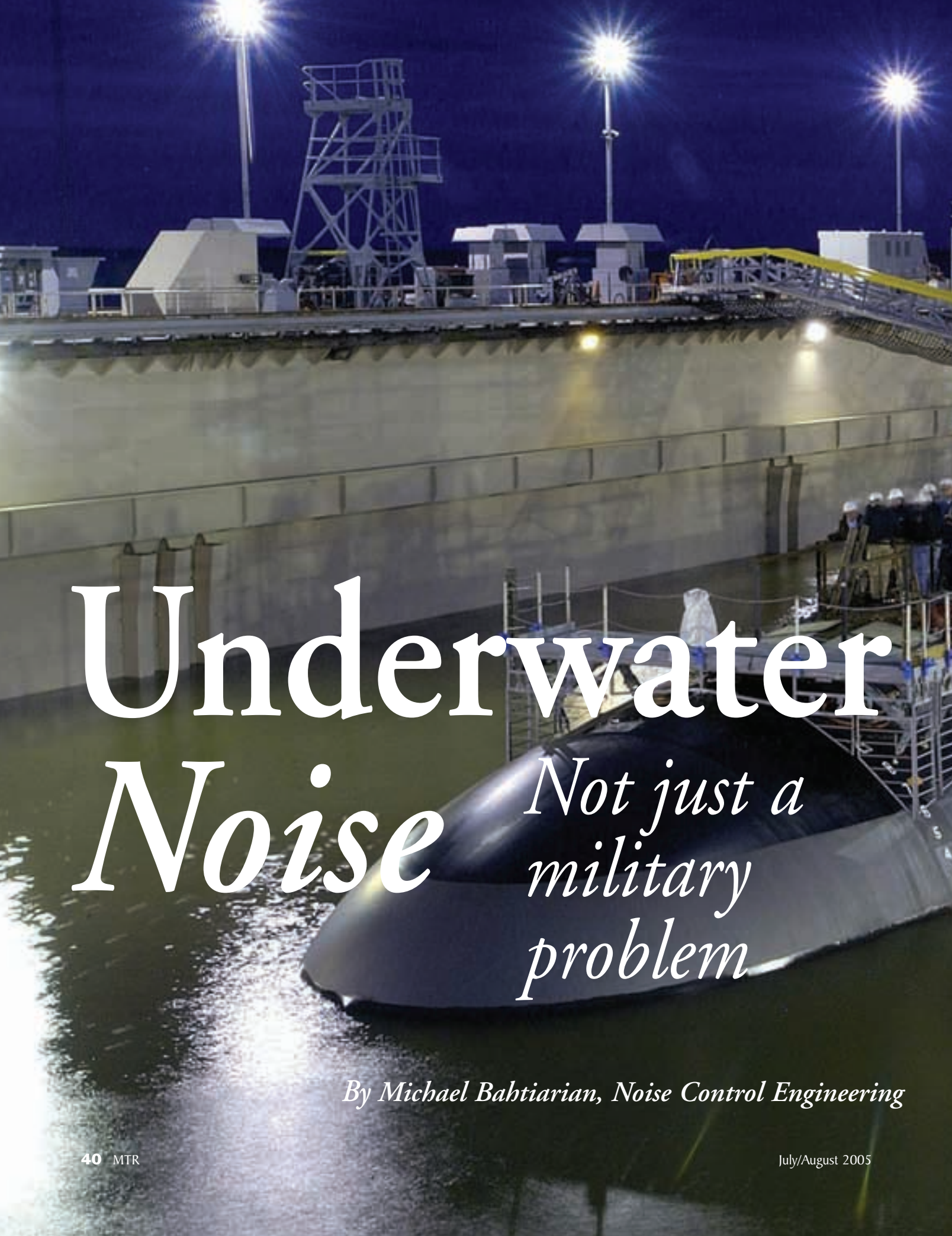
Technical Report Judges
Todd Gregory (Institute for Exploration)
Anna P.M. Michel (MIT/WHOI)

The Results
1st Place: High Technology High School, Lynncroft, NJ
2nd Place: Milton Academy, Milton, Mass.
3rd Place: North Kingstown High School, North Kingstown, RI

Other Prize
SAIC Engineering + Creativitiy Award: Plymouth North High School
Best Bang for the Buck Award: North Kingstown High School
Rookie of the Year Award: East Lyme Middle School
Best Pool Mission: Milton Academy
Sippican Communications Award: South Kingstown High School
Most Talented Pilot Award: Cambridge Rindge and Latin School
ComeBack Kid Award: The Sound School
Team Spirit Award: East Lyme High School

4th Annual National Student ROV Competition

The Marine Advanced Technology Education (MATE) Center and the Marine Technology Society's (MTS) ROV Committee teamed up with the NASA Johnson Space Center's Neutral Buoyancy Lab (NBL) to take students from the depths of the oceans to the far reaches of outer space during the 4th Annual National Student ROV Competition which took place June 17-19, 2005 at the NBL in Houston, Texas.
More than 40 high school, community college, and university teams from across the U.S. and Canada tackled missions where they "explored" Jupiter's moon Europa or entered "underwater Olympic" events that range from simulating the installation of a new instrument module on the Hubble space telescope to capping an old oil well and repairing a damaged fiber optic telecommunications cable. Underwater robots competing for a national title will replace astronauts training for space missions in the NBL's 6.2-million gallon, 40-foot deep pool, which has mock-ups of the space shuttle and International Space Station secured on the bottom. The two top contestants from the six regional events traveled to Houston for the finals. Jill Zande, Director of the MATE program ,said, "this year six regional events are feeding into the Ranger class national; New England, Southern California, Monterey Bay, California, Texas, Hawaii, and Florida, which is new this year.”
The winning vehicle in the tougher, Explorer Class was Eastern Edge Robotic Team from St. Johns, New Foundland. This team also won the best overall score award and the Rookie of the Year award for being a first time competitor with the highest overall score. The winning vehicle in the Ranger Class was the High Tech High School from Lincroft, New Jersey. There were prizes that recognized many of the distinctive features of the competitors and their vehicles; including the Biggest Bang for the Buck given to Palm Beach Lakes High School of West Palm Beach, Florida for spending the least amount of money on a vehicle that performed well. The most important thing was what NASA's Dr. Lotson said, " It doesn't matter if you finished 1st or 2nd or last, ocean and space organizations need you. Stay involved study hard and keep thinking outside the universe!"



Underwater Noise

Not just a military problem

By Michael Bahtiarian, Noise Control Engineering

The U.S. Navy's Virginia-class attack submarine offers improved stealthiness, sophisticated surveillance capabilities and Special Warfare enhancements that will enable it to meet the Navy's multimission requirements. Photo courtesy of Chris Oxley, Northrop Grumman Corporation

Every submarine movie has the same scene: The lights in the submarine are dimmed to that dark-room red glow. The sonar operator is cupping his headset and waving his hand for the other sailors in the sonar room to be extra quiet. The captain is standing by in the command & control center waiting for the operator's results. All of a sudden, the sonar tech shouts something like, "depth changes entering the water", or "Typhoon-Class sub approaching", or my favorite from the Hunt for Red October, "Crazy Ivan"… I think everyone can understand the reasons for quiet submarines, "the original stealth fighter," as one advertisement read. The realm of quiet underwater vessels is becoming more of an issue for non-military and even commercial vessels. The U.S. government just took delivery of the first-in-class, forty-day endurance, Fisheries Research Vessel or FRV-40. The OSCAR DYSON is owned and operated by National Oceanic and Atmospheric Administration (NOAA).

The ship is filled with state-of-the-art sonar systems for

its primary mission of fish stock assessment, i.e. fish counting. In order to perform that mission, the FRV needed to become one of the most underwater silenced ships in the world (more on that later).

In the past five years, the U.S maritime research community has begun an enterprise started by their European colleagues almost 20 years ago. The delivery of the OSCAR DYSON marks the first quieted U.S. Research Vessel (R/V) and more ships are on the way. The driving force behind underwater silencing is for improved operation of more sophisticated sonar systems. These sonar systems are being used for fish counting, acoustic imaging and many other general science purposes.

Underwater Acoustics 101

Without getting into the intricate technical details there are a few matters about underwater noise that readers should know. First, underwater noise is quantified similarly to airborne noise (i.e. noise that we hear). Both waterborne and airborne noise levels are reported in units of decibels (dB) referred to as "Sound Pressure Levels." Airborne sound is measured with microphones and underwater noise is measured with hydrophones. However, due to differences in the physical properties and the decibel computation methods, airborne noise levels are not the same as underwater noise levels. This situation is similar to the differences between temperature measured in degrees Fahrenheit and degrees Centigrade.

For those inclined to convert from air to water, the sound level underwater is equivalent to the sound level in air plus 62 decibels (dB) for equivalent acoustic energy. For example, comparing a large airliner with a sound level of 120 dB , the equivalent underwater sound level would be 182 dB . A typical cargo/container vessel generates an underwater sound level of approximately 190 dB2 and thus could be considered noisier than the jet when you make this somewhat artificial comparison.

Quantifying the sound levels of vessels must account for the distance between the source and the measurement. For in-air sound measurements, distances of 3, 10 and 50 feet have been used depending on the type and size of equipment. For underwater noise the reference distance has been chosen to be 1 meter. However, the noise measurements are taken at distances of 50 to 200 meters and then mathematically normalized to a distance of 1 meter and presented as units of dB relative to 1 µ Pascal at 1 meter.

The measurement of a vessel's underwater noise is a fairly formal and involved operation. The subject vessel and support platform must travel to an open area in the ocean with relatively deep water and far from shipping traffic. The weather must also be clear and calm. The U.S. Navy has established permanent acoustic noise ranges on Andros Island in the Bahamas (AUTEC) and Behm Canal near Ketchikan, Alaska (SEAFAC).

A commercial underwater measurement is made by having the subject ship pass by the hydrophones which are suspended from another vessel. This "support ship" must shut down all machinery while noise measurements are being taken. All instrumentation is run on batteries or a small generator. As the subject vessel passes by the distance at the closest point of approach (CPA) must be recorded in order to normalize the sound levels to 1 meter.

Underwater noise levels range from lows of 70 dB to the highs of 260 dB. The highest levels are underwater geological events like earthquakes and volcano eruptions.

TABLE 1
Underwater Sound Levels

Noise Level dB @ 1 meter	Typical Underwater Noise Sources
250 to 260	Undersea Earthquakes, Volcano Eruption*
250	Seismic Air-Gun Array*
200 to 190	Large Tanker Underway
170	Tug & Barge Underway (10 knots)
160 to 190	Marine Life Articulation*
160	Quieted Vessels (non-military)
150	US Navy Diver Maximum Exposure
120	Onset of Whale & Dolphin, Avoidance Behavior
100	Ambient Level in Calm Sea
90	Shipping Channel, Heavy Activity
80	Shipping Channel, Normal Activity
70	Coastal Bay with Snapping Shrimp

* Data from Howe, Bruce, Ocean Acoustic Observatories (AST) Cruise Report, Applied Physics Laboratory, University of Washington, 10 July, 1996.

When NOAA took delivery of the Oscar Dyson, it was the first U.S. designed and built Fisheries Research Vessel to meet the ICES CRR 209 noise requirements. The ship is named after an Alaskan fisherman, fishing activist and industry advisor who died in 1995. It was built by VT Halter Marine at its Moss Point shipyard in Mississippi, and has a diesel-electric plant with power coming from two Caterpillar 3508's and two 3512's.

The loudest man-made underwater sounds are seismic air-guns used in oil exploration. The loudest ships are around 190 to 200 dB and usually comprise the biggest types of tanker and container vessels. A tug and barge underway at relative slow speed generates about 170 dB while the quieted vessels at 11 knots generate about 160 dB.

Marine life generates sound levels in the range 160 to 190 dB, but avoidance behavior starts as low as 120 dB. Ambient sea sound levels are 70 to 100 dB depending on other marine life and proximity to shipping lanes. Table 1, found on page 42, lists these and some other underwater sound levels.

What's Loud Down There?

Now that you know what the underwater sound level is for various sources, we can discuss what is too loud? This obviously depends on who is listening. During my first engineering job at General Dynamics Electric Boat Division in the mid 1980's we were concerned with only one listener, Soviet submarines. The Seawolf-Class submarine was originally going to be a Class of 30 ships. The fall of the Soviet Union reduced that number to three, the last of which, the USS Jimmy Carter was just commissioned. Obviously, the details of underwater noise control and noise limits of all U.S. submarines is classified material and I have been away from that part of the industry to even remember the technical details.

For non-military vessels the field of underwater noise got its teeth in a 1995 report issued by the International Council for the Exploration of the Sea or ICES. In its Cooperative Research Report No. 209 (CRR 209) authored by Mr. Ron Mitson, the international oceanographic community drew a line in the sand as to what is too loud. The ICES CRR 209 underwater noise limit only applies to research vessels conducting fisheries research. The report was prepared to address the rising concern that fish exhibited adverse reactions to increased vessel noise as far away as 400 meters from a ship. An analogy was given in Report 209 that, "...scientists making underwater observations and measurements need quiet underwater vessels for the same reason astronomers have to site their telescopes on mountain tops…."

The CRR 209 limit takes into account the prevention of fish startling (cod, herring and similar species) and interference with sonar systems. Dr. D. Van Holliday points out that the CRR 209 limit was only intended to silence ships in order to measure fish biomass. Dr. Holliday is the

Principal Scientist/Director of Analysis & Applied Research at BAE Systems and was one of the U.S. representatives on the working group which reviewed CRR 209. He notes that, CRR 209 was never intended to be used as a yardstick to "minimize potential harm to life in the sea." Before the 1995 report, there were numerous studies discussing and quantifying non-military vessel radiated noise. These studies started in the 1960's and were mostly conducted throughout Europe. While very little research appears to have been published in the United States during this period, Dr. Holliday notes that significant research was conducted at the University of Maryland on fish hearing reaction to noise.

Dr. Holliday notes that, "The risks, rationale and costs in the military applications of ship silencing are very different than those for the fisheries assessment communities. CRR 209 was a carefully reasoned (and) measured attempt to balance risks and costs (of ship silencing) as specifically driven by the data quality requirements of modern fisheries assessment fleets". However, as of today, the ICES CRR 209 remains to be the only non-military underwater noise limit. No U.S. equivalent standard has been created.

How to Keep the Waters Quiet

Designing a vessel to be quiet underwater (acoustically quiet) is not a simple task. It is also not something you can just add to vessel capability in the middle of construction and certainly not something that you can accomplish after a vessel has been completed. Building a vessel that is acoustically quiet requires concerted effort from the owner, operator, naval architect, shipyard and most certainly the marine acoustical engineer.

The phrase, "do not try this unless you are a trained professional" certainly applies. The reason for such snobbery is that the transmission of shipboard generated noise is pervasive. It can travel down any faulty machinery mount, piping run or faulty structure. Also, the noise control treatments required cannot be retrofitted after the vessel is completed. In some cases, the noise requirements can drive selection of the types of equipment such as propellers, drives, diesel engines and propulsion motors.

Now that the appropriate warnings have been given, keeping the waters quiet involves many noise control elements. Some of these treatments are the same materials used for making vessel compartments quiet and any vessel that meets the CRR 209 underwater noise limit should generally have quiet interior compartments. The only exceptions would be the engine room which will always have high noise levels and any compartment with noisy HVAC systems.

Controlling underwater noise requires first and foremost a quiet propeller. There are no noise control treatments that can be applied to a noisy propeller, so it must be designed to be quiet. This means minimizing cavitation. Briefly, cavitation is the vaporization of water due to a decrease of the local pressure which generates millions of very small vapor bubbles whose collapse generates significant underwater noise. The cavitation inception speed must be well below the speed at which the vessel is required to be quiet. Bow Thrusters are very noisy underwater and unless someone invents a new bow thruster they must be excluded from operation during quiet operations.

As for the balance of propulsion and auxiliary machinery, the next most significant noise producing equipment are the diesel engines. As noted in CRR 209, the best propulsion train configuration for meeting underwater noise is a diesel electric plant. This allows for effective isolation of the diesel generators not always possible with direct drive configurations. The use of high-quality DC electric motors will also minimize vibration being induced into the hull. Other equipment which would need to be potentially treated includes large reciprocating machinery (such as refrigeration plants and air compressors), sea connected systems (such as sea water cooling systems) large pumps, large HVAC fans and hydraulic power units.

Any reciprocating machine generates high vibration which needs to be isolated from the hull. Generally, diesel engines are mounted on two stages of vibration isolators. The same may need to be done for other reciprocating equipment. All but the very smallest pumps should be mounted on one stage of vibration isolation. Sea connected systems must be analyzed for fluidborne noise transmission. This is when sound from the pumping chamber (such as vane passage) is transmitted to the water via fluid in the piping. Mitigation of such noise can be accomplished with flexible pipe connections which attenuates both pipe structural and fluidborne energy.

To determine what treatments are and are not needed, a marine acoustical engineer should be performing underwater noise computations. The Navy has developed such methods for submarine design many years ago, but all this technology is obviously classified. There are other methods which are proprietary. Noise Control Engineering (Billerica, Mass.) has used portions of the SNAME Design Guide for Shipboard Airborne Noise (SNAME T&R 3-37) created in 1981 and unclassified data to con-

The NOAA Ship Oscar Dyson during underwater noise testing in the Gulf of Mexico. Buoy in the foreground was used to support hydrophones. (Photo by Michael Bahtiarian)

vert hull born vibration to underwater noise. Designer Noise, a new noise prediction program from Noise Control Engineering and Proteus Engineering (Annapolis, MD) could be used in the same fashion.

Noise predictions will allow the marine acoustical engineer to determine where and what other noise control treatments will be required. Such treatments include: vibration isolation (single and double stages), structural damping, acoustical absorption, and acoustical insulation.

Isolating the machinery requires more engineering than just putting the equipment on vibration isolators. The foundation must be designed to be dynamically stiff and the mounting system itself must take into account the six natural frequencies which come from the six degrees-of-freedom of any isolated machine. Most vibration isolation must use marine-grade isolators which have elastomeric elements and fail safe limit stops to prevent over travel. A waffle pattern rubber pad called distributed isolation material (or DIM) can be used for less critical applications. Damping tiles are applied to hull and bulkhead plating to reduce vibration within structure. It is a treatment which comes from submarine community. Acoustic insulation and absorptive materials can be one in the same material. It generally consists of fiberglass and barrier material in various layers with thicknesses of two to six inches. This treatment keeps airborne noise off the hull.

Europe Led the Way

So who as gone through the pains of design and construction of an acoustically quieted ship? Obviously, any Navy in the world has undertaken this task for both surface and submarine vessels. The U.S. Navy also has acoustically quieted non-combatant vessels such as T-AGOS 23 which is operated by the MSC for "oceanographic research." The design and results of these vessels whether U.S. or other nationality are closely guarded. As member of the Seawolf Sound and Vibration design team, I can say that even the acronym for some noise control

treatments were classified.

As far as acoustically quieted research vessels, Europe led the way. The first vessel to be constructed to be acoustically quieted is the FRV Corystes which was put into service in 1988 by the Center for Environment Fisheries and Aquaculture Science (CEFAS) in the United Kingdom. It was built by Ferguson, the renowned British shipbuilder. The North Atlantic Treaty Organization, or NATO, also put an acoustically quieted vessel into service in 1988, the NRV Alliance, which was built by Muggiano shipyard in La Spezia, Italy. It should be noted that both vessels were put into service eight years before CRR 209 was even published.

It was not until 10 years later in 1998 that the FRV Scotia began operations for the Scottish Executive Rural Affairs Department, Fisheries Research Services. It was also built by Ferguson. In 2000 Iceland put the R/S Arni Fridriksson into service. Built by ASMAR in Chile, it is the first non-European built quieted research vessel. In 2002, a rush of quieted vessels hit the seas. In 2002, NATO put into service the 28 meter CRV Leonardo. However, this vessel will only achieve the CRR 209 levels at 4-5 knots. In 2003, the 78 meter G.O. SARS was delivered to the Institute of Marine Research in Bergen, Norway, and the 73 meter FRV Endeavour, built by Ferguson Shipbuilders, was added to the CEFAS fleet. Finally, in 2004 the 65 meter FRV Celtic Explorer was delivered to the Marine Institute in Ireland by Damen Shipyards.

Of these eight vessels, four were from the United Kingdom; two were from NATO, one from Norway and one from Iceland. All are operated by European based organizations and agencies. Through 2004, no such vessels were delivered to the United States or any other part of the world. Dr. Holliday of BAE Systems believes that one reason for lagging U.S. position in this arena is the United States lack of consumption of seafood as compared with the rest of the world. "It is often treated as delicacy rather than a staple," notes Dr. Holliday.

U.S. Gets its Own Quiet Ship:
NOAA Ship OSCAR DYSON

The U.S. got into the act earlier this year, when NOAA took delivery of the Oscar Dyson, the first U.S. designed and built Fisheries Research Vessel to meet the ICES CRR 209 noise requirements. The ship is named after an Alaskan fisherman, fishing activist and industry advisor who died in 1995. The vessel was built by VT Halter Marine at their Moss Point shipyard in Mississippi under the project management of Mr. Eric Richards.

The 64 meter, FRV-40 Class has diesel-electric plant with power coming from two Caterpillar 3508's and two 3512's. These diesels are mounted on double stage mounts which uses the "point mass" concept. The hull and propeller were designed by the government and given to VT Halter as part of the contract. The ship is propelled by a single 14 foot diameter propeller turned by a 2250 kW ASI Robocon dc motor.

NOAA's local construction representative or COTR is Stephen Madden who has helped build other fisheries and Navy research vessels. He notes that "this ship was extremely difficult to build for a number of reasons; the first and foremost difficulty was the size of the vessel. Extensive noise treatment that was used required about 20 percent extra space to install. The vessel was size limited because of existing dock space and the extra 20% was not available. The shipyard used computer modeling techniques, but because of the damping tiles and insulation thickness access to machinery was limited."

The bulk of the noise control treatments were engineered by Noise Control Engineering of Billerica, Massachusetts along with the engineering staff of VT Halter Marine. Raymond Fischer is NCE's President and lead engineer on the project for his firm. With over 25 years of shipboard noise control projects, Mr. Fischer agrees with COTR Madden, that "It was the most difficult design/construction project I have worked on including naval combatants…." NCE used it new Designer-Noise software to perform noise predictions for the ship and evaluate the acoustic impacts from all propulsion and auxiliary machinery. One of the major noise control treatments was hull damping tiles, which is a material that is used extensively in U.S. submarines. It is a plastic tile which absorbs vibratory energy in ship structure, particularly the hull. Both Fischer and Madden agree that getting the damping material into the ship was the most difficult part of the noise control. NCE engineers had to work closely with engineers from VT Halter Marine and NOAA to optimize all the noise treatments. In one case, aluminum was recommended over steel for damping constraining plates, saving 20 tons. Most vibration producing auxiliary equipment was isolation mounted on Christie & Grey (United Kingdom) mounts. Engine room insulation consisted of a three layer material using fiberglass, barrier material and fiberglass. All critical piping systems were isolated from the ship with thick rubber hangers (a modified "Nelson" hanger). Ray Fischer mentions that, inspection of treatments installation by NOAA personnel

The government designed, acoustically quieted propeller for the Oscar Dyson.
(Photo by Noise Control Engineering, Inc.)

was also critical to the overall success."

Aside from the treatments themselves, the NOAA contract included an extensive sound and vibration testing program that was carried out by both equipment vendors and Noise Control Engineering. All noise critical machinery had sound and vibration measured both in the factory and as installed in the ship. This included the ASI Propulsion Motors, all Caterpillar diesel generators, air compressor, hydraulic power units, pumps and HVAC equipment. VT Halter Marine conducted about 10 underway sea trials events. Noise Control Engineering attended seven different underway trips measuring noise and vibration. This ranged from quick one day trips where underwater noise was measured using the Oscar Dyson RHIB to the full at-sea underwater noise survey.

Final at-sea measurement of underwater noise was conducted on September 10-11, 2004 in the Gulf of Mexico. Noise Control Engineering deployed its entire office to conduct this test. They were joined by the crew of the Tyson B., an offshore supply boat out of Dauphin Island, Alabama, VT Halter Test & Trials, NOAA on-site personnel and Naval Surface Warfare Center (NSWC) personnel.

The Gulf of Mexico survey was performed five days before Hurricane Ivan, the huge storm that hit Mobile and Florida panhandle last year. High ambient underwater noise interfered with the sound from the Oscar Dyson and definitive underwater sound data was not collected below 80 Hertz. As a result, the government did not accept the NCE/VT Halter radiated noise test and required the shipyard to bring the Oscar Dyson to the Navy's AUTEC Range for further testing. The Navy test was performed in mid December with similar results to those found by the shipbuilder. The Navy and NOAA gave its final approval in early 2005 and subsequently the ship was delivered on January 5.

Is the Oscar Dyson the quietest RV in the world? According to NOAA's Madden, "I think this vessel far exceeds what is available in the rest of the world". According to NCE's Fischer, "It is certainly among the quietest. This vessel also had a requirement for low narrowband (tonal) sound, which has not been a requirement

on other FRV's".

According to another senior NOAA official, who has the quietest R/V is irrelevant. "NOAA cooperates with our European counterparts and fisheries scientific organizations and continues to share and conduct technology transfer for the benefit of the world fisheries. The story of the ship technology development as well as the concurrent improvements in acoustic scientific survey equipment capability is part of a big success story for global fisheries management."

Delaware's Quiet R/V

The second quiet R/V in the United States will belong to its second smallest state. The University of Delaware, College of Marine Sciences, is currently building its own version of a quiet R/V. It will replace the almost 30 year old Cape Henlopen which is part of the UNOLS Fleet. The Cape Henlopen Replacement Vessel or CHRV was designed by Dave Bonney's Bay Marine of Barrington, Rhode Island. Noise control was again designed by Noise Control Engineering. The vessel is currently under construction at Dakota Creek Industries in Anacortes, Wash.

The university wanted an ICES capable ship so that they can conduct "coastal and inland fisheries work where large vessels (like Oscar Dyson) fear to tread…." according to Matt Hawkins, former Cape Henlopen captain and currently the Director of Marine Operations with the College of Marine Sciences in Lewes, Delaware. In addition a quieter boat allows the University to perform more "acoustics work with Office of Naval Research and Naval Research Labs, two large customers for the UNOLS Fleet."

Like the FRV-40 the CHRV will be a diesel electric plant, use double stage mounted diesels, single stage mounted auxiliaries, extensive damping and insulation. Unlike FRV-40, the CHRV will use a floating engine room deck for double stage genset isolation and a pair of special vibration isolated Schottel Z-Drives. With a budget of less than half of that of the FRV-40, the only way to achieve the CRR-209 is to reduce the speed at which the criteria is achieved. The CHRV is designed to meet the CRR-209 limit at a speed of 8 knots. FRV-40 and most of the other quiet R/V's were operating at 11 knots.

The Future

The expected delivery of Delaware's vessel to its home port in Lewes is October 2005. The second FRV, now being identified as FSV-2 is expected to be completed in late 2005. It will be home ported at the NOAA National Marine Fisheries facility in Woods Hole Massachusetts. A third FSV is under construction at VT Halter Marine and a fourth is planned, but yet to be funded.

Matt Hawkins, who also serves as the Vice Chair of UNOLS R/V Operators Committee points out that, "With careful design starting from the initial concepts; achieving these underwater radiated noise goals is not unreasonable; even for a vessel not solely dedicated to fisheries work. All future R/V's should strive to meet these underwater radiated noise goals because noise impact on the underwater environment is a growing concern and to study the effects of acoustics, and to use acoustic tools for survey, you really need a quiet vessel. The additional cost appears to be mostly up-front, and in very rough terms, it appears to be around 30% more than a conventional vessel not meeting ICES."

Underwater Noise has been not just the military's problem for at least five years in the U.S. However, the problem is still limited to the Federal government and state organizations. The commercial and private sector has had some involvement with underwater vessel noise, but that is more exception rather than the rule at this time. Commercial technology and ship design are ready and available for low underwater noise vessels and the premiums should only be getting lower as time passes.

Michael Bahtiarian is a Vice President at Noise Control Engineering in Billerica, Massachusetts. He started his career at General Dynamics Electric Boat Division as a sound and vibration engineer on the Seawolf (S6W) program. He has a Bachelors degree in mechanical engineering from Pennsylvania State University and a Master's degree in mechanical engineering from Rensselaer Polytechnic Institute (RPI). Mr. Bahtiarian is also a Board Certified acoustical engineer by the Institute of Noise Control Engineers (INCE). Mr. Bahtiarian and Noise Control Engineering continue to be involved in both the NOAA FRV-40 and the University of Delaware projects. He can be contacted at mikeb@noise-control.com.

Obituary
David W. Porta

Dave Porta, a marine technology icon, passed away June 7, 2005. Porta, co-founder of Datasonics, died suddenly from a blood clot associated with a rare form of cancer, Leiomyosarcoma, at Cape Cod Hospital in Hyannis, Massachusetts.

An avid long distance bicyclist, triathlete, sailor, innovator, Porta was in the picture of health and in his prime, seemingly at the age of 67. He had been semi retired since the sale of Datasonics to Benthos in 1999. He and his wife, Nancy had migrated south in winters to enjoy the balmy Florida breezes, moving north for Cape Cod and Maine coastal summers. He leaves a large family and eight grandchildren.

"Dave was a great innovator", said Bill Dalton, his work partner and friend of at least forty years. "He and I made a great team. We would bounce ideas off one another and together we would come up with the solution." When asked what Dave would like to be remembered for in the marine technology industry, Bill Dalton suggested that both he and Dave made a special effort to bring young people into the business. They did this by offering internships for students from several schools and colleges including Northeastern University, which was Dave's Alma matter. There are still people in the marine technology industry that got their start at Datasonics right out of Cape Cod Technical High School, for instance. After attending high school in Connecticut, Dave enlisted in the

US Navy and served as a cryptographer. He then attended Northeastern University and received a degree in electrical engineering. It was while on a Co-Op at Massa Products in Hingham, Massachusetts that Dave got the ocean industry bug.

After graduation, Dave worked as an applications engineer at Ocean Research and Engineering in Falmouth, Mass. ORE was a spin off of Woods Hole Oceanographic Institution producing acoustic flow measurement equipment for scientists and Navy researchers.

Dave left ORE to work for an electronics manufacturing company in Boston. Tired of the commute, Dave started his own company, Cape Town Electronics installing technical alarm systems and custom home stereo systems. Later in the seventies he sold that business and re-joined ORE.

Underwater acoustics was Dave's specialty. In 1980, Dave and Bill Dalton left ORE and started Datasonics in Bill Dalton's cellar building underwater acoustic systems for offshore oil companies. In those early days, Datasonics designed and built custom acoustic arrays to for researches at Lamont Doherty and acoustic systems for mapping internal waves for NOAA. Later on, Datasonics became known as the source for underwater acoustic releases, Chirp geophysical equipment, and underwater modems. Datasonics grew from a shoe string cellar operation to an $8.5 million company 19 years later.

In 1999, Benthos purchased Datasonics. Dave continued with Benthos as a consultant for a year and then joined his old buddy at Akousticos/Falmouth Scientific developing underwater systems. Recently, Dave and Bill and others had just received an SBIR phase one award to design and build an unmoored station keeping buoy to provide remote communications for the US Navy.

According to his son-in-law and colleague, James Cappellini of Mooring Systems, Dave was a terrific applications field sales person. He connected well with clients anticipating their needs and applying acoustic principles to enable them to obtain the underwater and geophysical data they needed.

"I learned so much about project management, proposal writing and customer relations from Dave," said Cappellini.

Dave's bright smile, his Florida weather reports, his boundless energy, his willing and innovative ear will be sorely missed.

Contributions can be sent in his memory to: The Cam Neeley Foundation, 30 Winter Street, Boston, MA 02108 or Cape Cod Free Clinic, PO Box 5, Falmouth, MA 02541.

— Maggie L. Merrill

Obituary
Patrick F. Madison

Patrick F. Madison, co-founder of MAR-VEL International, died the morning of June 10, 2005 after a brief illness. He was 90 years of age.

Madison, along with Everett Edmund, founded M&E Marine Supply in 1946. MAR-VEL Underwater Equipment, Inc. was a division of M&E Marine. In 2000 the name was changed to MAR-VEL International, Inc. Madison served for many years as President of MAR-VEL. After his retirement, Mr. Madison played a vital roll as a member of the Board of Directors even up until his passing. Madison was an extremely active man who was a member of the Explorers Society, a pilot, and was recently nominated to the Commercial Divers Hall of Fame.

UK Submarine Award to Nautronix

Nautronix signed a multimillion-dollar, three-year enabling/rental contract with the U.K. Ministry of Defence for a NASNet tracking range system. The range will be used by the Ministry of Defense (MoD) in the acceptance of the S&T final phase submarine tactical weapons system. Mark Patterson, Nautronix CEO, said the MoD requirement is for a large-area acoustic tracking range, deployable in deep water, with highly accurate positional data available in real time to both sub-surface and surface vessels.

Schilling Robotics Opens Houston Office

Schilling Robotics, a leader in subsea equipment, opened a regional office in Houston earlier this year.

The Houston office joins Schilling Robotics' headquarters in Davis, Calif. and the North Sea regional office in Aberdeen, U.K. to provide worldwide service to the offshore energy industry. "Since Houston is central to one of the world's major offshore oil regions, we look forward to providing on-the-ground, personal service to our customers in the area," said Jason Stanley, Schilling Robotics vice president and regional manager. The office address is: Schilling Robotics-Gulf of Mexico, 11757 Katy Freeway, Suite 1300, Houston, Texas 77079-1725.

Perry Slingsby Systems' Appoints North Sea Rep

Perry Slingsby Systems entered into an agreement with Scan Tech U.K. Ltd. to offer the range of Perry Slingsby Systems ROV tooling. Perry Slingsby Systems and Scan Tech will work together to ensure that the latest in ROV tooling is available to North Sea clients, meeting the evolving and expanding market for ROV Standard and Bespoke Tooling. "A growing number of customers require the facility to rent quality ROV tooling products. To meet this emerging need our business model has been expanded beyond straight sales of ROV tooling systems and now includes a number of exclusive Tooling Rental Outlets," said David Gillies, Tooling Sales Manager, Perry Slingsby Systems.

Gardline Buys Titan Environmental

A leading near-shore surveyor, Titan Environmental Surveys Ltd. (Ogmore by Sea, Mid Glamorgan,Wales), now operates under the Gardline Marine Sciences Ltd. flag. Titan specializes in coastal environmental activities and hydrometric surveys for water utilities, oil & gas companies, ports and harbors, and the construction industry. Gardline Environmental Ltd.'s general manager, Phil Durrant, was named director of Titan. More at www.titansurveys.com or www.gardline.com.

$7.4 Million UUV Contract Awarded

Northrop Grumman Corp., Electronic Sensors and Systems/Oceanic and Naval Systems, Annapolis, Md., is being awarded a $7,381,315 cost-plus-award-fee contract for the development of components, systems, and subsystems to provide sonar solutions for high-resolution bottom mine detection and classification for use in unmanned undersea vehicle applications. Work will be performed in Annapolis, Md., and is expected to be completed by February 2007. Contract funds will

not expire at the end of the current fiscal year. This contract was competitively procured via a Topical Broad Agency Announcement and eight offers were received. The Naval Undersea Warfare Center, Newport, R.I., is the contracting activity.

Survey Firm Buys Norwegian Vessel

C&C Technologies purchased M/V Northern Resolution from Malene Østervold Shipping AS of Torangsvåg, Norway. C&C said the 247-ft. Norwegian flagged vessel will assist in acquiring geophysical and geotechnical data.

It has accommodations for 50 passengers and can transit at a speed of 12 knots for up to 50 days duration. Currently in dry-dock in New Orleans, vessel modifications will include hull-mounting an EA 600 deep-water single beam profiler and an EM 120 multibeam echosounder (both from Kongsberg Maritime AS, Horten, Norway), installing the launch and retrieval system for C&C's new C-Surveyor II AUV, and altering the vessel's design to ensure efficient operations. Although the majority of the projects intended for the Northern Resolution are AUV assignments, the vessel will also be mobilized to perform conventional geophysical surveys and deep-water geotechnical soil sampling. More at www.cctechnol.com.

Iridium Establishes Developer Program

The oceanographic firm of Oceanscience Group (Oceanside, California) joined three others as "value added developers" for Iridium Satellite LLC. "Iridium has created its VAD program to establish direct technical relationships with companies that have a particular expertise or capability to develop new products or solutions using Iridium voice or data service," said Greg Ewert, Iridium's executive vice president.

Iridium is a provider of global satellite voice and data solutions with complete coverage of the earth (including oceans, airways, and polar regions) through its constellation of 66 low-earth orbiting, cross-linked satellites and 12 in-orbit spares. The Oceanscience Group specializes in the development of oceanographic and hydrologic instrument deployment and communication equipment. Value-added developers work directly with Iridium service providers, value-added resellers, and value-added manufacturers to distribute their solutions or products. More at www.iridium.com.

Oceanography Center Renamed

The U.K.'s National Oceanography Center came into being May 1 following its renaming from the Southampton Oceanography Center. With the change comes a new director, Professor Ed Hill. He noted, "The formal designation as a National Center, with the accompanying change of name, is a natural progression for the center. It reinforces its position and reflects the expectation that it will act as the national focus for oceanography. This will also facilitate in an inclusive way a strategic coordination of research for the UK's marine and earth science community." More at www.soc.soton.ac.uk.

Applanix Announces New Management Structure

Applanix Corp. appointed Brad Koziey as director of sales and Kevin Perkins as executive sales manager, Airborne Products for the Americas. Koziey will assume responsibility for strategic sales planning, management and support for the complete line of Applanix products for the land, airborne and marine markets worldwide. Perkins will oversee all airborne sales for North, South, and Central America. More at www.applanix.com.

Statoil Opens Houston Office

Officials of the Norwegian oil major announced that its U.S. office opened up in Houston, Texas. The Statoil ASA office will follow up opportunities in the Gulf of Mexico region. More at www.statoil.com.

Satlantic Wins 2005 Exporter Award

Satlantic Inc. won the prestigious 2005 Nova Scotia Exporter of the Year Award presented by Atlantic Canada Opportunity Agency (ACOA) and Nova Scotia Business Inc. last May 19. About 90 percent of Satlantic's oceanographic optical sensor sales are made to international clients.

More at www.satlantic.com.

Super Sensitive Detector for Finding Shipwrecks

Over the last 50 years most shipwrecks have been found with the help of a magnetometer. These super sensitive metal detectors, first used in WWII to locate and track submarines, have become one of the primary underwater search tools for both the salvage industry and the scientific community.

Mags sense changes in the earth's magnetic field. Any object made of iron or steel creates a disturbance in the magnetic field. A mag can detect a major disturbance, like the one created by a steel wreck, at a distance of a quarter-mile or more.

Today, the Proton magnetometer is a workhorse in marine search operation. It is deployed by a diverse group including professional treasure hunters, marine archeologists, commercial diving companies, law enforcement agencies, and military units. The proton mag is designed to be a rugged, reliable instrument that is very easy to operate. In addition to finding shipwrecks, mags are often employed to locate pipelines, anchors, sunken automobiles, weapons, and unexploded ordnance.

JW Fishers specializes in the design and manufacture of magnetometers and currently produce two mags; the Proton 4 boat-towed model and the Diver Mag 1, a hand-held unit carried by a diver. The Proton 4 features an LCD display that is backlit for night operations and an audio alarm to alert the operator when a target is encountered. The Diver Mag 1 has an LED display for easy underwater viewing and a waterproof earphone that lets the diver know a target is being detected.

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ELAC Selected For LCS

ELAC Nautik achieved success in the U.S. market together with its sister company L-3 Communications Ocean Systems. The Navigation and Detection Sonar NDS 3070 Vanguard was selected for one of the U.S. Navy's Littoral Combat Ship designs. The main purpose of NDS 3070 Vanguard is to protect the vessel against mines, hostile divers, midget submarines and similar threats. It combines a 3-D forward looking sonar and an omni-directional 2-D sonar.

In addition to NDS 3070 Vanguard, Elac Nautik's Naval Echosounder VE 5900 has been contracted for the LCS program as well.

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Underwater Camera Housing

The Tetra 7070 is a compact housing providing access to the LCD screen for instant feedback and accurate subject composition. Multiple lens options are available including a specific Wide Angle Dome that maximizes the Olympus 7070 lens to deliver an astounding 95 degrees of coverage The Tetra 7070 includes the newest version of the ROC strobe controller.

The new ROC features a double flash exposure system that monitors and duplicates the camera pre-flash and actual flash sequence with compatible strobes.

Tetra is available as a solo housing or as a complete Travel Package system featuring one or two strobes, Wetlink flash connectors, Wetlink bulkheads ULC strobe arms, accessories and custom case.

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LED Multi SeaCam 2065

DeepSea Power & Light expanded its LED Multi SeaCam line of cameras with a new color model that combines a low-light sensitive module, ease of use and ruggedness in a compact, light weight case to deliver the optimum performance. The new LED Multi SeaCam 2065 contains many of the same features as prior versions including 24 intense LED's, a robust titanium housing certified to 4000 m, a virtually scratch resistant sapphire window, and an array of connector options. Light sensitivity has been improved to 1.1 Lux. The camera also incorporates four LED settings enabling users to adjust their light intensity for unpredictable working environments.

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ROV Powered Rock Drill

Phoenix International Inc. has reportedly developed a capability to take underwater rock cores using an ROV. Spokesman Tim Janaitis said company engineers successfully integrated a rock-coring system with its 400-hp ROV, Nereus II. Engineers modified the vehicle and drill to demonstrate an ability to take five-ft.-long, 2.375-in.-diameter rock cores using ROV supplied hydraulic power. Cores can be taken in water depths to 8,000 ft. and on slopes up to 45 degrees. Typical coring time is approximately 40 minutes.

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Applanix Debuts POS MV Wavemaster

Applanix Corp. unveiled its compact POS MV WaveMaster (position and orientation system for marine vessels) at the U.S. Hydro 2005 conference in San Diego late last month. Peter Canter, the firm's director of marine products, said, "The new unit is tailored for small boat operations." Built on integrated inertial/GPS technology, WaveMaster delivers a full six degree-of-freedom position and orientation solution. All POS variables and timing information are available as motion compensation and georeferencing data for use with all multi-beam sonar systems.

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Iridium to Launch New Data Modem

Iridium Satellite LLC announced a "new, cost-effective 9600 data transceiver" based on the company's short burst data (SBD) technology. A spokesman said the move would extend the capabilities of Iridium to "a new set of markets, expanding service in asset tracking, remote monitoring, and telemetry reporting." The 9600 transceiver "will permit Iridium's solution partners to offer the only complete capability with the following features — global coverage, uniform low-latency, two-way communications, and low hardware cost," said Don Thoma, executive vice president. Iridium anticipates production deliveries to begin in late 2005.

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Geometrics's New Digital Seismic Streamer

Geometrics Inc. introduced the GeoEel, a 24-bit digital seismic streamer. Its wide bandwidth (up to 8 kHz) makes it applicable to all seismic surveys: petroleum, high-resolution engineering, and even sub-bottom profiling. It is 1.5 in. in diameter and configurable with up to 240 channels and multiple streamers, the GeoEel sends data by Ethernet to any industry-standard PC. The GeoEel is the first high-resolution-digital streamer to be filled with a non-toxic, non-flammable silicone oil derivative. This is desgned to eliminate fire hazard or fines in environmentally sensitive areas due to accidental rips or tears in the streamer skin. The GeoEel's narrow design is ultra-quiet, making full use of its 24-bit circuitry. In-water digitization eliminates ground loops and shipboard electrical noise, resulting in quick, clean, quality installations. A thick 3.2-mm skin protects the GeoEel in shallow water and transition zone applications.

Visit www.maritimeequipment.com/mt & Click No. 11

BlueView Offers Compact Sonar Imaging System

BlueView Technologies announced the release of its ProViewer series of multi-beam imaging sonar. The product of University Government R&D, the ProViewer is designed to offer miniaturization technology to make affordable high-performance imaging sonar available to the defense, commercial and homeland security industries. Dr. Lee Thompson, a senior scientist at the University of Washington's Applied Physics Lab and co-founder of BlueView Technologies, recently joined BlueView full time as their Chief Technology Officer. He said, "ProViewer offers next-generation streaming sonar imagery that dramatically improves the viewing of submerged objects such as shipwrecks, fish, and divers — even in shallow water environments." ProViewer uses BlueView's technology to generate multiple narrow beams on each transmission, designed to produce five to 10 images per second. The same unit can be placed in both horizontal and vertical positions, designed to provide both realistic 2-D images of underwater environments or accurate profile views of the bottom and structure in front of the sonar. Both transducer and electronics are contained in a single compact housing, with only a thin cable providing power from and digital communications to the system. With a standard USB1 interface, the ProViewer can easily run from most Windows-based computers.

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Vertical Water Quality Profiling from YSI

YSI Environmental introduced a line of Vertical Profiling Systems for automated profiling of water columns. These systems are fully compatible with YSI sondes, enabling accurate water quality data collection.

Several deployment options are available:

- Fixed Profiling System, for mounting on piers, dams, and bridges;
- Buoy Based Profiling System for deployment in lakes, reservoirs, and coastal environments;
- Pontoon Mounted Profiling System with optional meteorological package.

Applications include surface water, drinking water reservoirs, hydropower, and near coastal and ocean research. Multiparameter sondes provide real-time readings for dissolved oxygen, temperature, conductivity, pH, turbidity, and other parameters.

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RV Dyson Outfitted with Simrad

Simrad, Inc. of Lynnwood, Wash., outfitted RV Dyson with a full complement of fish location and monitoring equipment. Among the array of electronics is a split-beam Simrad EK60 Scientific Echo Sounder, which operates on four frequencies (18 kHz, 38 kHz, 120 kHz and 200 kHz) and is designed to provide accurate echo sounding, data storage, data analysis and reporting of results. The vessel also includes a Simrad SM2000 Multibeam Echo Sounder, engineered for bathymetric survey and vertical water column target detection. RV/Dyson was also outfitted with a Simrad FS20/25 Trawl Sonar system that provides the bridge with real-time images of fish targets and net operation. This is augmented by Simrad's ITI Wireless Trawl Positioning and Monitoring System, which uses small battery-powered sensors mounted on the trawl to transmit important information to the bridge. Completing the R/V Dyson's Simrad electronics package is an ES60 Commercial Echo Sounder.

Visit www.maritimeequipment.com/mt & Click No. 16

Reson Debuts SeaBat 7128 Sonar

Reson expanded its product line with the SeaBat 7128, a new Multibeam Forward Looking Sonar. The SeaBat 7128 is a single and/or dual frequency (200/400 kHz) system, available in depth ratings of 400 or 6,000 m. The system has been specifically designed for incorporation in a variety of platforms, from surface vessel, ROV or AUV. The SeaBat 7128's focused ultra-narrow beams, high ping rate and high bandwidth are designed to provide the user with superior resolution at effective long ranges.

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Marine Sonic Offers Next Generation of SHARPS

Marine Sonic Technology working in partnership with Hermetic Sciences, delivered components of the next generation Sonic High Accuracy Ranging and Positioning System (SHARPS) to Woods Hole Oceanographic Institute. SHARPS is being used for positioning and control of the 6,500 m Jason/Medea ROV during missions where very high resolution position information is required.

(Photo Credit: Jason ROV, Image courtesy of WHOI)

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ARTI Offers the Rescue Shuttle

Advanced Rescue Technologies Inc. (ARTI) offers the Rescue Shuttle, designed for first-response users: search and rescue, fire, police, hospital, and military applications, plus a variety of uses in the mining and shipping industries. The Rescue Shuttle protects patients from the elements regardless of the recovery scenario: marine rescues, mineshaft extractions, aerial evacuations, limited access accident scenes, mountain/snow and rugged terrain rescues, etc. The Model 5000 is a Biological/Chemical Containment Unit and is the only device of its kind with the ability to enclose a biologically or chemically infected patient inside the shuttle.

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MSC Security System Available

Beach Panel & Controls, Inc. has developed access-control perimeter security systems for Military Support Command vessels. The same technology, developed in 2003, is now available for commercial vessels. The shipboard security modules are engineered to enhance and expand the ability to detect and alarm crew of unauthorized boarding or tampering with secure areas. The electronic system allows crew members to monitor selected locations simultaneously throughout the ship. The fully-integrated system works on a touch screen that combines real-time video surveillance, alarms at points of entry, hull perimeter lighting and audible warning systems to alert the crew of encroachments and unauthorized breaches.

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Triton Software to Process HUGIN Data

The Royal Norwegian Navy (RNoN) purchased Triton Imaging's Fusion-Office software to perform post-mission processing of multibeam and sidescan data from the HUGIN 1000 autonomous underwater vehicle (AUV). Triton's software is in operation on-board the Oksoy Class mine warfare vessel, KNM Karmoy. The Karmoy is currently performing EOD missions in the Baltic Sea as part of NATO's immediate reaction force MCMFORNORTH.

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Side Scan Systems From EdgeTech

EdgeTech Marine's 4200-FS Dual Mode Side Scan System offers two software selectable modes of operation: High Definition Mode (HDM) for superior resolution and High Speed Mode (HSM) for dual pulse operation at up to 10 knots. An added feature for the 4200-FS is its ability to get good resolution target data at over 200 m per side on the high frequency. The 4200-FS has the ability to run over 6000m of coax cable and can be towed at above five knots without having to use a depressor.

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EM 3002 Multibeam on R/V Gloria Michelle

The U.S. National Oceanic and Atmospheric Administration's (NOAA) Northeast Fisheries Science Center (NEFSC), awarded a contract

The 'R/V Gloria Michelle' is home ported at the State Fish Pier in New Bedford, Mass.

to Kongsberg Maritime, Inc. for the supply and installation of suite of survey and positioning equipment and software for the NOAA R/V Gloria Michelle. The package includes an EM 3002 (Single) Multibeam Sounding System including Operator Station Software (SIS), MRU-6 Motion Reference Unit, Seapath 20 Heading Reference Unit, Kongsberg bathymetric post-processing software and Echoview water column post-processing software.

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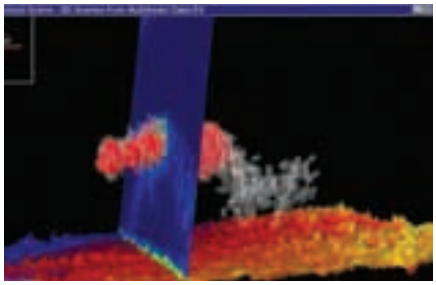
Multibeam Water Column Imaging

The new multibeam echo sounder, EM 3002, is designed to extend the functionality of multibeam echo sounders to cover 3-D imaging of biomass and other acoustic reflectors that might be present in the water column. 160 acoustic beams are sampled digitally with a spatial resolution of 15cm for each ping, creating a digital image of a slice of the water mass under the transducer. When the ship is sailing forward, a 3-D description can be obtained by combining the images from several pings. The raw display image is available as part of the operator interface.



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IXSEA Signs Navy Deal

iXSea signed a $1.8 million contract with DCN (Direction des Constructions Navales) on behalf of the French Navy. This contract is the second part of a large contract signed last year and will involve equipping OCTANS and PHINS products for navigational and combat systems on different types of French Navy surface vessels.

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BIRNS Connectors

BIRNS now produces Type I molded cable plugs in accordance with USA Military Specification MIL-C-24231D(SH), commonly known as "Portsmouth" connectors. BIRNS also produces GPS-frequency coaxial connectors, and certain "advanced" connector systems designed to obviate problems often associated with standard M24231 and/or EB 3004 models.

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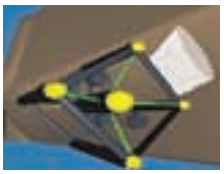
SonicWorks Underwater Ship Hull Inspection



With concerns of security, the in-water inspection process performed by a SonicWorks Inspection system combines the company's proprietary APNS precision positioning and robotic control system with SonicWorks' Motion Compensation System to provide a vehicle equipped with hull contouring technology that is designed to produce a full hull (100 percent in water) in a matter of hours.

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Pneumatic Chainsaw for Underwater Use

CS Unitec recommends its 4 hp Pneumatic Chain Saw for underwater applications requiring powerful, efficient cutting of wood pilings and other material. Available in models with 15, 17, 21 and 25-in. cutting capacities, this underwater saw is equipped with a .404 pitch Super Chisel saw chain and a chain guard to protect the operator. An optional Carbide saw chain allows the user to cut green oak or wood with barnacles, nails and creosote.

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Communication Equipment and Services Guide

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www.actech.gr
Anastasios Vitinides
tel: +30 2104 630825
fax: +30 2104 630725
email:info@actech.gr
Descr: Automation and Control Technology
Products: Automation , Control & Monitoring System`s for Oil tankers , LPG & LNG Ships,Cargo Ships

AGMarine, Inc.
5711 34th Avenue NW Suite 201
Gig Harbor, WA 98335
www.agmarine.com
Devon Liles
tel: 253-851-0862
fax: 253-851-0865
email:devonl@agmarine.com
Descr: Distributor Comercial Marine Navigation
Products: Gyrocompass, Autopilot, Speed Log, Magnetic Compass, RAI, Steering Gear, Charting Systems

Anteon
3211 Jermantown Rd., Fairfax, VA 22030
www.anteon.com
Eugene Vogt
tel: 703-246-0717
fax: 703-246-0346
email:evogt@anteon.com
Descr: Systems Engineering, Integration, IT Support, Testing & Evaluation, Rescue21, Deepwater, and AIS support
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St. John`s, NL A1C5J9 Canada
www.infotechcanada.com
Victor A. Bonnah
tel: 709-726-4736
fax: 709-726-4743
email:ace@acelgroup.ca
Descr: Marine IT
Products: Satellite systems, Tracking, Web pages, E-Commerce, Security,

At Sea Electronics, Inc.
5364 Ehrlich Road, #17,Tampa, FL 33624
www.AtSeaElectronics.com
Ronald Hoel
tel: 813-961-3829
fax: 775-256-3048
Sales_Department@AtSeaElectronics.com
Products: Marine Satellite & Terrstreial Radio/TV Antennas, Amplifiers and Distribution Systems

AXYS Technologies
2045 Mills Rd
Sidney, BC V8L 3S8
Canada
www.axystechnologies.com
Don Bryan
tel: 250-655-5847
fax: 250-655-5856
email:dbryan@axystechnologies.com
Descr: Remote environmental monitoring systems
Products: Buoys, Marine and Land Monitoring systems, Sensors, Processors, Moorings, Telemetry, Service, Consulting

Boatracs Inc.
9155 Brown Deer Road
San Diego, CA 92121
www.boatracs.com
Craig Kairis
tel: 425-945-1091
fax: 425-649-2258
email:ckairis@boatracs.com
Descr: Satellite Data Communications
Products: See the vessel on a map from a web browser; VMS approved in selected areas; send or receive email from the vessel; send important information to the home office w/o waiting.

C2SAT Communications AB
Kungsvagen 26
Sollentuna, SOLLENTUNA 191 45,Sweden
www.c2sat.com
Mats Back
tel: +46 (0)8 748 01 44
fax: +46 (0)8 748 01 43
email:mats.back@c2sat.se
Products: Stabilized antennas, VSATs, maritime satellite communications

Center for Maritime Education Gulf Region
9650 High Level Road
Houston, TX 77029
www.seamenschurch.org
Captain Arnie Rothstein
tel: 713-674-1236
fax: 713-674-1239
email:arothstein@seamenschurch.org
Descr: Simulator Training Maritime
Products: Education and Training

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One West Otterson St.
Nashua, NH 03060
www.cepoint.net
Rock Romeo
tel: 603-883-7979
fax: 603-883-3266
email:romworld@earthlink.net
Descr: Marine Technology Equipment Manufacturer
Products: Ruggedized Shipboad computers, GPS Systems, IRIG -B time-stamp/Video Frame Grabber Systems

Climatronics Corporation
140 Wilbur Place
Bohemia, NY 11716
www.climatronics.com
David W. Gilmore
tel: 631-567-7300
fax: 631-567-7585
email:sales@climatronics.com
Descr: Provide environmental monitoring solutions for Homeland Security, HazMat/NBC Response, artillery fire control support, and environmental regulatory compliance.
Products: TACMET II portable weather stations provide on-site, real-time data for wind speed/direction, temperature, RH and pressure.

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www.comarkmarine.com
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tel: 508-359-8161
fax: 508-359-2267
email:info@comarkcorp.com
Products: Manufacturer of Marine PCs, High Bright Displays

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fax: +33 4 91 21 77 01
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Products: Control systems subsea , detailed engineering, crawlers, dynamic positioning, conceptual design, instrumentation, feasibility studies, pipeline equipment, instrumentation

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839 - D West 1st. Street
North Vancouver, BC V7P 1A4 Canada
www.DataStarMarine.com
Karen Palmer or Richard Simpson
tel: 604.990.6900
fax: 604.990.6890
email:kpalmer@datastarmarine.com
Products: Marine PC, Flat Panel Displays, Touch Screen, Monitoriing, Security and Control Systems

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Abbotsford, BC V2T 6H1 Canada
www.deepdevelopmentcorp.com
Muriel Orr
tel: 1.877.864.9671
fax: 1.604.864.8472
email:morr@deepdevelopmentcorp.com
Descr: High Resolution Recording for Tough Marine Environments
Products: Viperfish Land, Viperfish Amphibian, Viperfish DEEP

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Ridgefield Park, NJ 07660
www.dvtel.com
Kim Robbins
tel: 201.708.9820
fax: 201.368.2615
email:info@dvtel.com
Descr: IP Security & Surveillance Solutions
Products: Network Video Management System for monitoring, recording & analysis, IP Cameras, Camera Stitching Software, Screen Recording System, Incident Reporting & Management Software

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4039 21st Ave West #302
Seattle, WA 98199
www.electroniccharts.com
Jim Brantingham
tel: 206-282-4990
fax: 206-282-7088
email:seanav@mindspring.com
Descr: Manufacturer of marine navigation systems and electronic charts.
Products: ECC-GLOBE; GLOBE-AIS

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S.C.de Bariloche, RN 8400 Argentina
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Walter Rojo
tel: +54(0)2944527747
email:navalpatagonica@educ.ar
Descr: Marine Electronics Service Maintenance
Products: Radar, VTS, ECDIS, Depthsounder, GMDSS, Gyrocompass, Autopilot, GPS, Float tracking, AIS, Electronics Charting systems

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4200 Dow Rd., Suite C, Melbourne, FL 32934
www.emx-inc.com
Tim Arion
tel: 321-751-0111
fax: 321-751-0085
email:clientservices@emx-inc.com
Descr: Manufacturer of Thermal Camera Systems
Products: Marine/Vehicle systems, Weapon Sights, Mobile Infrared, Hand Helds, Long/Short Range Surveillance

FarSounder, Inc.
95 Hathaway Center Suite 5
Providence, RI 02907
WWW.FARSOUNDER.COM
Cheryl M. Zimmerman, CEO
tel: 401-784-6700
fax: 401-784-6708
email:info@farsounder.com
Descr: Manufacturer` of 3D Forward Looking Sonar Systems for navigation, obstacle avoidance, shallow water survey and security applications for the marine sector
Products: 3D Forward Looking Sonar Systems: FS-3 System, FS-3DT Systems, Aluminum and Stainless steel models

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www.fwmurphy.com
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fax: 918.317.4266
email:sales@fwmurphy.com
Descr: FW Murphy is an ISO 9001 registered manufacturer committed to providing innovative products and services for comprehensive equipment management and control solutions.
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Camas, WA 98607
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Jeff Kauzlaric
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fax: 360-834-9400
email:info@furuno.com
Descr: Marine Electronics Manufacturer
Products: Radar, Fish Finders, GPS Chart Plotters, AIS, GMDSS, Sounders, Sonar, Integrated Nav Systems, Satellite Communcations

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461 So. Milpitas Blvd., Milpitas, CA 95035
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tel: 408-933-4543
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email:sales@globewireless.com
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Manitowoc, WI 54220
www.guardianwirless.com
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fax: 920-686-1998
email:sales@guardianwirless.com
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Products: Yacht Guardian, Marine Guardian, Ship Guardian

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www.impactweather.com
Mike Arellano
tel: 713-947-5789
fax: 713-943-4645
email:marellano@impactweather.com
Descr: Marine weather services
Products: Weather forecasts, consulting, weather equipment

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www.industronic.com
Marvin Zimmerman
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fax: +49 9342 87117
email:marvin.zimmerman@industronic.de
Descr: Intercom Systems Manufacturer
Products: Fault Tolerant PA/GA Talkback Systems

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Arlington, VA 22209
www.inmarsat.com
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www.itc-us.net
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email:akbar@itc-us.net
Descr: Marine Control & Power System Integration
Products: Integrated Alarm & Monitoring, Bridge & Engine Room Control Console, UPS, HMI/MMI System, Telemetry/SCADA Sys, Instrumentation & Display, Engineer/General/Dead Man Alarm Sys

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East Greenwich, RI 02818
Tom Opishinski
tel: 401-398-0871
fax: 206-495-0871
email:iocean@cox.net
Descr: Oceanographic, hydrologic and meteorologic data acquisition system, operation and integration; Field surveys and services/equipment deployment and recovery; Instrumentation and system design; Software, web and GIS application development
Products: Manufacturer`s Representative: Sontek and YSI

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www.invsat.com
Michael Salmon
tel: +44 (0)1224 428400
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email:enquiries@invsat.com
Descr: VSAT and telecommunications systems integration
Products: Stabilized VSAT, Inmarsat, radio

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Bethesda, MD 20817
www.iridium.com
Information Center
tel: +1-480-752-5155 (Option 2)
fax: +1-301-571-6250
email:info@iridium.com
Descr: Iridium Satellite LLC (www.iridium.com) is the only provider of truly global satellite voice and data solutions with complete coverage of the earth (including oceans, airways and Polar Regions).
Products: Voice and data satellite communications services

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Seattle, WA
www.jrcamerica.com
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email:bmorgan@jrcamerica.com
Descr: Marine Electronics Manufacturer
Products: AIS, VDR, Radar, Fish Finders, GPS, GPS Compass, Inmarsat F-77, Radiotelecommunications, GMDSS, Sonar, SSAS

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611 Maidstone Road, Rochester, UK
www.kme.co.uk
Gary C. Wright
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fax: +44 1634 830619
email:sales@kme.co.uk
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Products: 19", 21" and 23" Marine Monitors for use in Communication, Navigation and Ships

Automation applications

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Strandpromenaden 50
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www.km.kongsberg.com
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email:lisbeth.johanne.ramde@kongsberg.com
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Chris Watson- Corporate Communications Manager
tel: 401-847-3327
fax: 401-849-0045
email:cwatson@kvh.com
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9 Malcolm Hoyt Drive
Newburyport, MA 01950
www.henschel.com/comp_content_h.htm...
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Miramar, FL 33025
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Descr: VSAT Communications Provider
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Rockville, MD 20852
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Descr: Marlink provides global maritime communications via satellite
Products: Inmarsat, Iridium and maritime broadband VSAT products and services

Nautronix
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www.nautronix.com
Laura Cruickshank
tel: 01224 775700
fax: 01224 775800
email:laura.cruickshank@nautronix.co.uk
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Seattle, WA 98102
www.noaa.gov
Gary Gales
tel: 206.553.5749
fax: 206.553.4340
email:gary.r.gales@noaa.gov
Descr: Ocean Research

OMNEX Control Systems Inc.
74-1833 Coast Meridian Road
Port Coquitlam, BC V3C 6G5
Canada
www.omnexcontrols.com
Karin Micheelsen
tel: 604-944-9247
fax: 604-944-9267
email:kmicheelsen@omnexcontrols.com
Descr: Manufacturer of radio remote controls for marine applications
Products: wireless, frequency hopping spread spectrum radio remote transmitters, receivers and accessories

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Hilversum, 1223KZ
Netherlands
www.sopho.philips
Martin van der Veeken
tel: +31 35 689 1058
fax: +31 35 689 1173
email:martin.van.der.veeken@philips.com
Descr: Leading supplier of voice communication solutions serving small to large-sized vessels
Products: Telephony platforms (IP, Hybrid, TDM) terminals (IP, wireless, softphone,digital, analog), Management System, voice mail system, messaging/alarming system, speech recognition

Racorder Marine, LLC
PO Box 938, Hiway 41 North
Monteagle, TN 37356
www.racorder.com
Mike Roark
tel: 931 924 3216
fax: 931 924 3287
email:mike@racorder.com
Descr: Manufacture of recording devices
Products: Racorder - the Marine Black Box

Radio Holland Netherlands
Eekhoutstraat 2
Rotterdam, ZH 3008 AB Netherlands
www.radioholland.nl
A.W. van der Plas
tel: +31 10 4283344
fax: +31 10 4281498
email:info@radioholland.nl
Descr: Suppliers and service provider of maritime electronics and IT solutions
Products: Communication, Navigation, Automation equipment for maritime industry

RAE Systems
1339 Moffett Park Dr., Sunnyvale, CA 94089
www.raesystems.com
Amanda Leet
tel: 877-723-2878
fax: 408-752-0724
email:raesales@raesystems.com
Descr: Hazardous Environment Detection Solutions
Products: Rapidly-deployable, multi- and single-sensor chemical and radiation detection monitors and networks

Rutter Technologies Inc.
22 Pearl Place,
St-John`s, NL A1E 4P3 Canada
www.ruttertech.com
Gerald F. Olscamp, P.Eng.
tel: +1-709-386-4213
fax: +1-709-368-1337
email:golscamp@ruttertech.com
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Sterling, VA 20168
www.transpondertech.se
Stuart Tolman
tel: 954-785-2876
fax: 954-785-8578
email:stuart.tolman@saabus.com
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Products: AIS for mobil, base stations and aviation. DGPS navigation systems.

Seacoast Electronics Inc.
240 Talleyrand Ave
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seaserve.com
Kevin Mahoney
tel: 904 355 0343
fax: 904 356 9088
email:info@seaserve.com
Descr: Communications and Navigation Equipment and Engineering Service Provider
Products: Communication, Navigation, Steering/Gyrocompass, IBS Integrated System Design, Shipborne Information Technology.

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1240 Vernon Way
El Cajon, CA 92020
www.seacon-usa.com
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fax: +1-619-562-9706
email:seacon@seacon-usa.com
Descr: Manufacturers
Products: Underwater electrical connectors

and fiber optics

Sea Tel
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www.seatel.com
Judy Borchelt
tel: 925-798-7979
fax: 925-798-7986
email:jborchelt@seatel.com
Descr: Marine stabilized antenna systems
Products: Antennas for TV, voice and data while at sea

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240 Talleyrand Ave., Jacksonville, FL 32202
www.seaserve.com
Kevin Mahoney
tel: 904 355 0343
fax: 904 356 9088
email:info@seaserve.com
Descr: Navigation and Electronic equipment sales and service
Products: All

Seimac Limited
271 Brownlow Ave.
Dartmouth, NS B3B 1W6
Canada
www.seimac.com
Adam Cameron
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selenia-marine.com
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fax: +44 1245 275689
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Via 40 No. 85-2202
Barranquilla, Atlantico 2509
Colombia
gruposemab@yahoo.com
Alex Ferrero Ronquillo
email:alexfferrero@hotmail.com
Descr: Work with bouys
Products: Bouys and Beacon

SERCEL Underwater Acoustics Division
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wwww.sercel.com
Jean Michel COUDEVILLE
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fax: +33 2 98 05 52 41
email:uad@sercel.fr
Descr: Underwater Acoustics, Marine Instrumentation
Products: Underwater Acoustic Modems, Portable Trackink and location systems, Argos beacons

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fax: 803 419-3099
email:cwoods@shakespeare-ce.com
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Descr: Satellite and Cellular Communications
Products: Voice, Internet, Email, Fax, GPS Tracking, Electronic Forms

SMD Telecommunications CC
336 Umbilo Road
Durban, 4014 South Africa
www.smd-marine.co.za
Bruce Dunn
tel: +27 31 205 1122
fax: +27 31 205 0999
email:bruce.dunn@smd-marine.co.za
Descr: Sales & Service for Marine Communications, Navigation and Hydrographic Equipment.
Products: Atlas Hydro, Chelsea Inst, Consilium Selesmar, Globe Wireless, Innerspace, JRC, Mackay Marine, McMurdo, NERA, Odom, Rutter, SAAB, SAM, Samsung HI, Satamatics, VT TSS, Yokogawa

Stentofon USA, Inc.
6119 Connecticut Avenue
Kansas City, MO 64120
www.zenitelusa.com
Bob Hager
tel: 770-973-0315
fax: 770-973-0315
email:bobhager@zenitelusa.com
Descr: Vingtor, Steenhans, Stento on-board communication
Products: Stento, Vingtor, Steenhans - Intercom & PG/GA & Loudhailing

Stratos
6901 Rockledge Drive, Suite 900
Bethesda, MD 20817
www.stratosglobal.com
tel: 1 888 766 1313
fax: 1 709 748 4300
email:info@stratosglobal.com
Descr: International Telecommunications Services Provider
Products: Inmarsat, Intelsat, Iridium, Globalstar, and VSAT products and service

TeamTalk Satellite
721 SE 17th St. Causeway
Ft. Lauderdale, FL 33316
www.teamtalksatellite.com
Vincent Valldeperas
tel: 954 468 5556
fax: 954 468 5557
email:vince.valldeperas@teamtalk.com
Descr: Value added services, news, e-mail, internet
Products: Super-Hub, SatNews, Internet on board, CruiseShow, CruiseMail

Subsea Vision Ltd.
15 Southlands Ave, Corfe Mullen, Wimborne, Dorset, BH21 3JB UK
www.subseavision.com
Chris Bryant
tel: +44 1202 656861
fax: +44 1202 601530
email:office@subseavision.co.uk
Descr: Remotely Operated Vehicle Services

Telenor Satellite Services
1101 Wootton Parkway, 10th Floor
Rockville, MD 20852
www.telenor.com/satellite
Stefan Tillard
tel: 301 838 7814
fax: 301 838 7832
email:stefan.tillard@telenor-usa.com
Descr: Satellite communications - data, voice and secure.
Products: Inmarsat, Iridium and maritime broadband VSAT products and services.

Transas USA, Inc.
1727 Alaskan Way South
Seattle, WA 98134
www.transasusa.com
George Toma
tel: 206-838-3000
fax: 206-838-7900
email:sales@transasusa.com
Descr: Marine Technology Solutions. Transas USA, Inc. markets, sells, delivers, and supports the full range of Transas innovative reliable and unique products.
Products: The company's range of high-technology products includes onboard navigation systems and equipment, a broad range of maritime simulators, Vessel Traffic Service systems

Virtek Communication AS
Verftsbassenget 1
Horten, 3188 Norway
www.virtek.no
Morten Aasen
tel: +47 33030530
fax: +47 33030531
email:sales@virtek.no
Descr: Ship to shore communication
Products: CommBox

World Communication Center
1347 N. Alma School Road, Ste. 150
Chandler, AZ 85224
www.wcclp.com
Kristen Le
tel: 480 857 6656
fax: 480 857 6898
email:kristen.le@wcclp.com
Descr: leading provider of global satellite voice and data communications
Products: Iridium telephones, pagers, data capabilities, satellite broadband and service

DESIGN COMPLIANCE OFFICER

Job Location: Australia, Gold Coast

Auditing design compliances for commercial and recreational vessels up to 50 metres LOA. Consulting and auditing for European Union compliances (ISO certification), stability and inclining tests, drafting (structural, mechanical and electrical), field inspections for both commercial and recreational vessels. Small surveying practice (5 surveyors, 2 admin staff) fully accredited by government to certify commercial vessels as a ship designer and marine surveyor.
Suit a recent graduate in naval arachitecture or mechanical engineering. Must be self starting and able to work in a small close knit team. Good variety of work. Excellent pay and conditions. Immediate start. Check our website www.kpsmaritime.com.au

Nick Lockyer
KPS Maritime
Gold Coast City Marina
76-84 Waterway Drive
Coomera, 4209 Australia

Phone: 617 55297355
Fax: 617 55297544
Email: nick@kpsmaritime.com.au
WEB: ttp://www.kpsmaritime.com.au

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

ELECTRONICS ENGINEER

Job Location: USA, CA Huntington Beach

Rapidly expanding Huntington Beach Marine Electronics Company seeks electronics engineer with Marine and boat experience. Job description: software and systems control. Job Requirements: Application and system engineer as well as some design engineering who has an excellent understanding of marine field and Boats, with 3-5 years experience in marine related products and possesses strong PC and computer software skills; a hands-on person who can load software and ensure that the systems are loaded correctly and operate correctly and manage the archived release of software. Ensure all components are shipped out when systems are completed and ready for shipment. Send resume to: Electinc4@aol.com

Ana Muresean
MICAD Marine, LLC
5731 McFadden Avenue, Unit B
Huntington Beach, CA 92649 USA

Phone: 7148991006
Fax: 7148945430
Email: am@micadmarine.com
WEB: http://www.micadmarine.com

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

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 ENGINEER / SHIPBUILDING PROJECT ENGINEER

Job Location: Vietnam, Hai Phong

A Shipbuilding Company in Hai Phong City;
2001 - 2004
Project/contract management engineer, Business Dep't
Managed a group of shipbuilding projects and responsible for contracting and preparing technical & commecial documents for all projects world wide.
From contract initiation to the end of the guarantee period, worked on every service-design, purchase, logistic, production, and after-sale-with the customer, and ensure total customer satisfaction by respecting all deadlines, costs, and quality standards.
- Develop and implement contracting shipbuilding projects that include marketing, purchasing and negotiating with Customers/Suppliers.
- Represent the business department on a cross-functional team responsible for discussing, negotiating, translating/interpreting with Customer/Suppliers world wide related to shipbuilding projects, carried out at the yard.

Nguyen Dang Ha
Song Cam Shipyard
47 Chi Lang Street, Hong Bang District
Hai Phong, 008431, Vietnam

Phone: + 84 31 525974
Fax: + 84 31 525512
Email: dangha_shipbuilding@walla.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 measuring 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
- 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 SERVICE TECHNICIAN

Job Location: USA, MD Stevensville

Immediate opening for a computer literate, self-starter to travel to our local & out of state customers to perform service work on a variety of mechanical, electro-mechanical, ancillary equipment and related control systems. Extensive travel and US citizenship is required. Excellent benefits. Please fax resume including salary requirements to (410) 643-6437 or send via email to czimmer @shipequip.com

Cheryl Zimmer
Allied Marine Services, Inc.
Stevensville, MD 21666 USA

Phone: 4106436313
Fax: 4106436437
Email: czimmer@shipequip.com

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

MARINE SYSTEMS LAB TECHNICIAN

Job Location: USA, ME Arundel

Full-time position that supports the Marine Systems Technology program, faculty and students in their teaching/learning of basic skills, systematic and efficient use of time and materials, craftsmanship and a work ethic that will guarantee customer satisfaction with work delivered as promised: on time, on budget and of professional quality. Duties include lab and demonstration preparation; ordering and invoicing;student supervision on project boat work; tool maintenance; inventory control; demonstrate and teach shop safety standards; cooperation and collaboration with program manager and instructor.

Barry Acker
Landing School of Boatbuilding and Design
P.O. Box 1490
Kennebunkport, ME 04046
USA

Phone: 207 985-7976
Fax: 207 985-7942
Email: barryacker@landingschool.edu
WEB: http://www.landingschool.edu

MARITIME ASSISSTANCE CENTER OPERATOR

Job Location: USA, VA Norfolk

Applicant must be assertive and once trained able to work with no direct supervision on a nights and weekends rotational schedule. Position requires the ability to render security assistance to clients during crisis situations and critical systems monitoring; researching and revising databases; gathering incident information; preparation of incident reports and collating, printing or filing information. A background with middle to upper management is preferred. The applicant will be required to know or learn maritime regulations and company security initiatives. Must be proficient in Microsoft Office (particularly Access, Word and Excel); Excellent oral and written communications skills are essential. Commercial shipping or maritime security experience is a plus. All qualified applicants should send resume and references as a Word document attachment to brinleybillings@securewest.com or fax resume and references to Brinley Billings at 757-461-8666.

Brinley Billings
Securewest International
420 North Center Drive,
Bldg 11, Suite 206
Norfolk, VA 23502
USA

Phone: 757-461-4343
Fax: 757-461-8666
Email: brinleybillings@securewest.com
WEB: http://www.securewest.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 / 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

OCEAN GOING WATCH KEEPING OFFICER

Job Location: Turkey, istanbul

merchant fleet

cagatay ayvali
cagatay

Email: cayvali@yahoo.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.

DIDING CASWADI
PT.SOLOMINDO PACIFIC INTERNASIONAL
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

OFFSHORE/MARITME SECURITY OFFICER

Job Location: United Arab Emirates,

Patro land escort duties, survillence and intelligence.

It commander prince louis abilimordi [rtd]
Iralh company ltd
po box 72650 victoria isla
vic island lagos, VA 72650, Nigeria

Phone: 2348055919264
Fax: 2348024659861
Email: louismordi@yahoo.ca

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

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

SHIPBUILDING ENGINNER

Job Location: Turkey, IZMIR

stutent shipbuilding enginner

YUSUF CELEP
MR.CELEP
BARBOROS CAD.NO : 13 KAT:2 ALIAGA
IZMIR, 35800
Turkey

Email: celep_y@yahoo.co.uk

SR. PROJECT ENGINEER

Job Location: USA, FL Daytona Beach

Ocean Design is the world leader in subsea electrical and fiber-optic interconnect systems.
ODI is an Engineer-to-Order company, employing skilled engineers and state-of-the-art design tools and processes used to design and manufacture a broad range of harsh environment systems and products.
ODI's high-reliability connectors, cable assemblies and junction boxes are used worldwide for offshore oil and gas, defense and communications, oceanographic and research applications.
ODI's wet-mateable connectors include signal and high-power electrical, fiber optic, and hybrid electro-optical products. All are based on patented oil-filled, pressure-balanced technology. Companion dry-mate submersible connectors compliment these wet-mate lines. These rugged components can be used at any ocean depth, and in the harshest environments.
Sr. Project Engineer
Essential Duties and Responsibilities:
- The main purpose of this position is to manage and perform the engineering design and development of ODI's products.
- Perform large-scale project level design and development of ODI products, as directed by the Engineering Manager, using CAD/CAE and conventional engineering techniques.
- Develop new applications requiring appreciable ingenuity and originality.
- Regularly interface with customers to develop business in new and existing markets.
- Generate, review and approve supporting documentation for designs, including assembly and test procedures.
- Manage large-scale projects to ensure timely completion.
- Provide engineering support to other departments, as required.
- Analyze existing systems and suggest improvements to facilitate workflow.
- Follow and contribute to the development of ODI procedures, accepted engineering practices, and any relevant design practices in accordance with given requirements.
- Work with the Engineering Manager to coordinate activities of lower-level engineers and designers.
- Work with account and project managers.
- Perform other duties as assigned by Engineering Manager.

Education and Experience:
- BSME or related engineering degree (Master's preferred/PE a plus)
- 4+ years experience in mechanical design engineering for I, 8+ years experience in mechanical design engineering for II.

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

Supervisory Responsibilities:
- None - No direct reports. Occasional direction of junior engineers and co-op students.

Training Requirements:
- IFS Overview
- Six Sigma Overview
- Hazardous Communications
- MS Outlook 2003
- Quality Systems

Physical Demands:
- Ordinary office capabilities

Work Environment:
- Quiet, office environment
- Occasional work in Manufacturing and Test areas
- Occasional travel, including overseas

Personal Protective Equipment:
- Use of safety glasses when in Manufacturing and Test areas.

Will be required to perform other duties as requested, directed or assigned.
Please apply via our website at www.odi.com to see more opportunities!

Cheryl Perreault
Ocean Design
9 Aviator Way
Ormond Beach, FL 32174
USA

Phone: 386-673-3575
Fax: 386-673-7411
Email: cperreault@odi.com
WEB: http://www.odi.com

SYSTEM SALES ENGINEER

Job Location: USA, MA Marion

YSI, Inc. is an employee-owned manufacturer of sensor technology dedicated to an ecologically sustainable world, providing measurement expertise for product development. At our Marion, MA location we are currently seeking candidates for a System Sales Engineer.
Main responsibility is to drive and support system sales worldwide, including manufacturers' agency support and performance and key customer development. Other duties include developing regional and worldwide business plans and regional sales/marketing strategies; meet sales, profit and budget targets; work with Marketing and R&D on product specification, and participate in design reviews.
The ideal candidate will have a Bachelors or Technical Degree in Science or Engineering, broad knowledge of monitoring system applications incorporating floating platforms, mooring communications, oceanographic instrumentation, and water quality equipment; knowledge of oceanography, aquatic biology, limnology, biology, geology, or hydrology; ACT, Excel, and Word skills; and strong negotiation and selling skills.
The compensation and benefits package is very competitive and includes medical, dental, vision, 401K, ESOP and more.

Amya Mulvaney
YSI, Inc.
Marion, MA 02738 USA

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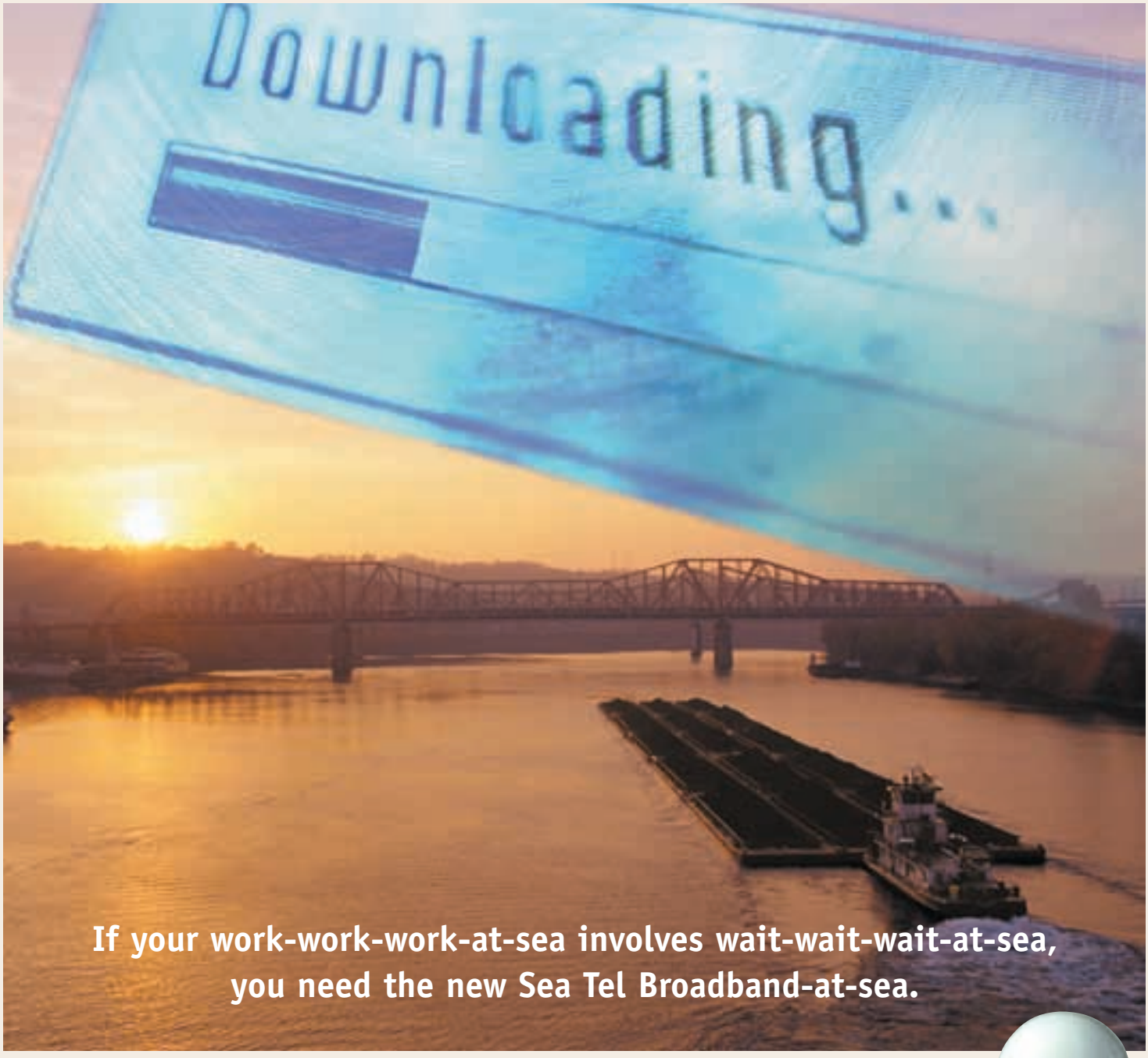

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4.15.03. [1] Source: KVH website [2] Source: Delta Communications website

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