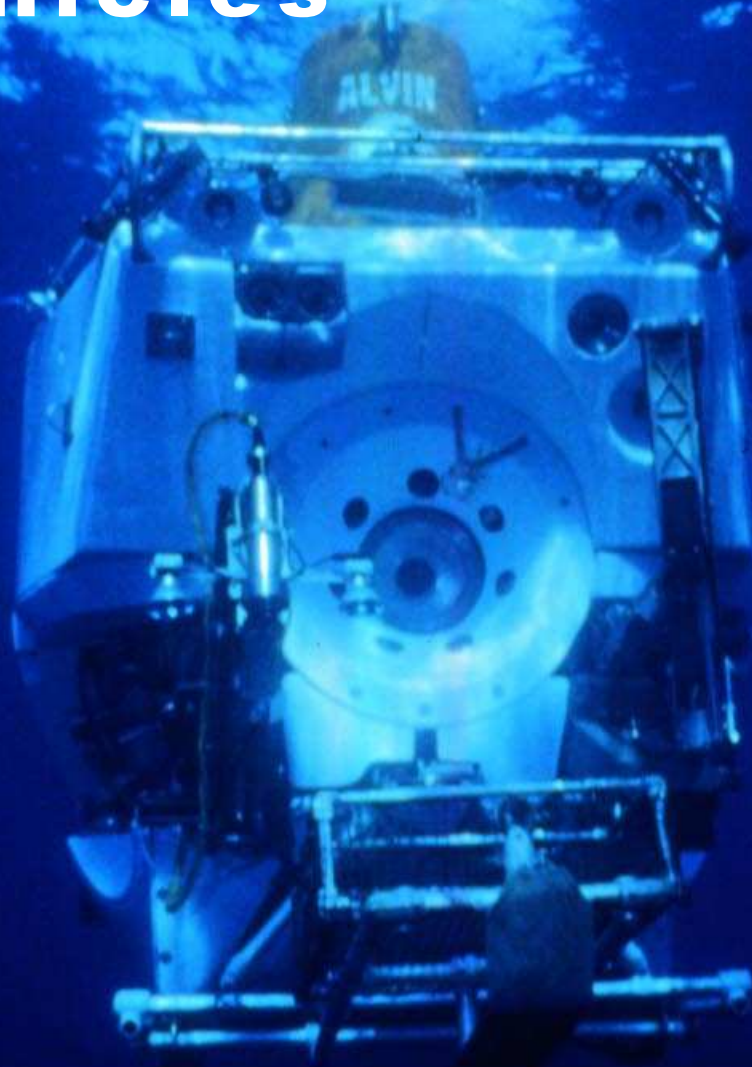


Marine Technology Society Manned Underwater Vehicles

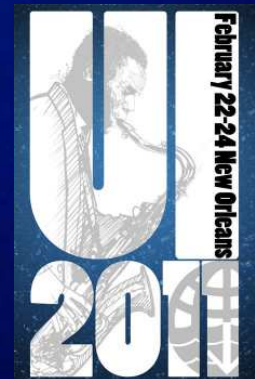


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UNDERWATER INTERVENTION

NEW ORLEANS 22-24 FEBRUARY 2011

8th Annual MUV PROGRAM

2011 MUV TECHNICAL PROGRAM

Room 206	DAY 1 Feb. 22, 2011	DAY 2 Feb. 23, 2011	DAY 3 Feb. 24, 2011
8:30-9:00		Development and Construction of the FC-01 Submersible By: Brett Phaneuf Submergence Group LLC, USA	PSUBS - Personal Submersibles Organization Overview By: Jon Wallace Psubs.Org
9:00-9:30	MTS Overview of Manned Sub Activity in 2010 by: William Kohnen MARINE TECHNOLOGY SOCIETY Manned Underwater Vehicles Committee, USA	VAS 525 - A 30 year Heritage of Submersible Vehicles with Diver Lockout Capability By: Sean Dooley Nautilus Systems, USA	Atmosphere Monitoring for Manned Submersibles By: Simon Lunt & Michelle Hudson Analox Sensor Technology Ltd, UK
9:30 to 10:00		The Evolution of a High Energy Density Silver Zinc Rechargeable Battery By: Zoe Adamedes BST Systems Inc, USA	Protecting Intellectual Property around the World Mitchell P. Brook Esq Luce, Forward, Hamilton, Scripps LLP, USA
10:00 to 10:30	BREAK	BREAK	BREAK
10:30 to 11:00	Fabrication Status for the ALVIN RHOV Personnel Sphere By: Jerry Henkener Southwest Research Institute, USA	SEAmagine Ocean Pearl Submersibles Delivered in 2010 By: Charles Kohnen SEAmagine Hydrospace Corp, USA	Technology Panel Discussion: High Energy Density Batteries for Manned Submersibles Moderator: William Kohnen Panelists: CORVUS Energy: Brent Perry NAVSEA: Kevin Cook WHOI: Daniel Gomez-Ibanez BST Systems: Zoe Adamedes ABS: Roy Thomas
11:00 to 11:30	Status Update for ALVIN Submersible Upgrade Program By: Kurt Uetz, Anthony Tarantino Woods Hole Oceanographic Institution, USA	Applications for ROVs on One Atmosphere Submersibles By: Sean Newsome SeaBotix, USA	
11:30 to 12:00	Performance & Safety of Large Lithium Ion Batteries for Human Occupied Vehicles By: Daniel Gomez-Ibanez Woods Hole Oceanographic Institution, USA	NMEA 2000 - an Ideal Network for Underwater Applications By: Jeff Hummel Rose Point Navigation Systems, USA	
	LUNCH	LUNCH AT THE MOVIES Diving in Mongolia: Adventures in the Land of Chinggis Khan by: Gregg Mikolasek In Depth International Inc.	
1:30 to 2:00	Diving Lake Baikal, Siberia, with Dr. Anatoly Sagalevich By: Paul Isley Botanical Press, Rainforest Flora Inc., USA	Studying the Cost of Navy Certification on Manned Submersibles By: Lori Bennett Applied Research Lab, Penn State Univ., USA	MTS Manned Underwater Vehicle Committee ANNUAL MUVc MEETING Chair: William Kohnen Co-chair: Vance Bradley Secretary: Daniel Lance
2:00 to 2:30	Sea Trials: Lessons Learned During our First Year Operating Research Sub Antipodes By: Guillermo Sohnlein OceanGate, USA	The US Navy's Deep Submergence Systems Safety Certification Program By: Alfred H. Ford PE Naval Sea Systems Command	
2:30 to 3:00	Project Palau - Deployment of Manned Sub in a Remote Pacific Outpost By: Bobby Adams, Chris Hartman American Aquanaut, USA		
3:00-3:30	BREAK	BREAK	BREAK
3:30 to 4:00	Filming Humboldt Squid Behavior with Red Light Technology By: Scott Cassell Undersea Voyager Project, USA	ABS Rule Changes Overview for 2011 ANNUAL ABS-INDUSTRY MEETING By: Roy Thomas ABS Americas, USA	
4:00 to 4:30	ExtendAIR Life Support Systems By: Tom McKenna, Tom Daley Micropore Inc.	ABS Rule Changes DISCUSSION	
4:30 to 5:00	Nuytco Overview of Submersible Operations in 2010 By: Phil Nuytten & Jeff Heaton Nuytco Research Ltd		

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Introduction

New Orleans is host once again to the Underwater Intervention conference and will be host for our 8th annual manned submersible forum. The venue, the location and the mix of delegates and speakers promise to create a unique atmosphere. The next few days will deliver overviews of industry activities, new product presentations, opinions, technical insight, knowledge, information and most importantly a great networking opportunity for all attendees. Coupled with a great showcase of exhibitors on the show floor, plus a full technical program on ROVs, AUV's and Diving Systems with several tutorials and workshops, we expect this year's conference to be an enjoyable and valuable event.

Above all, I encourage everyone to take full advantage of the list of speakers and delegates at this conference and if there are people you don't know, make it a point to meet them. There are several sessions this year that were structured to engage a panel discussion and a dialogue with the audience. If during the session you have a question you want to ask, don't hold back. Chances are it will be relevant, interesting and other delegates may be thinking the same thing.

Thank you for attending and thank you to the speakers for their participation, to Underwater Intervention for making everything happen, and to the exhibitors and sponsors for their support.

Welcome to Underwater Intervention 2011 and the Manned Underwater Vehicles Program and if you need anything, just let me know.

All the best

William Kohnen
Chairman
MTS MUV Committee

Day 1

Tuesday 22 February

9.00 – 10.00

William Kohnen, SEAmagine Hydrospace Corp



Mr. William Kohnen is Co-founder and CEO of SEAmagine Hydrospace Corp. which specializes in the design and construction of manned submersibles. Since 1995 the company successfully delivered 9 submersibles depth rated from 150 to 1500 ft. Mr. Kohnen has a background in aerospace with a M.Sc. Electrical Engr from McGill University, Canada. He has been chair of the Marine Technology Society Manned Underwater Vehicles Committee since 2003 and organizing the yearly MTS MUV forum at the Underwater Intervention conference to issues regarding the manned submersible industry. Mr. Kohnen is an active member of the Deep Submergence Pilot Association and an active member of the ASME Pressure Vessel for Human Occupancy (PVHO) Committee. He is also an active industry representative on the ALVIN Replacement HOV Oversight Committee (RHOC). He has over 15 years experience working with the US Coast Guard and ABS rules and regulations for building submersibles and is a member of the ABS Special Committee on Underwater Systems and Vehicles.

MTS Overview of Manned Submersible Activity in 2010

by: William Kohnen
Chair, MTS Manned Underwater Vehicles
Email: will.kohnen@seamagine.com

A short summary of the state of the Manned Submersible industry in 2010. The overview will look at developments in all branches of activity, including international research, tourism activity, leisure and security developments. This will include a summary of submersibles under Classification, operating and in construction, review of the yachting industry market status and outlook for manned vehicles in the military market.

10.00 – 10.30

COFFEE BREAK

10.30 – 11.00

Jerry Henkener, Southwest Research Institute



Jerry Henkener is a staff Engineer at Southwest Research Institute. He has been involved in the development of underwater systems for many years including diving equipment development for the US Navy during more than 12 years at Battelle and the development of manned and unmanned submersibles at Southwest Research Institute (SwRI) for the past 30 years. He is presently the lead engineer in the design, fabrication and test of the replacement personnel sphere for the ALVIN submersible and previously at SwRI he was the lead engineer for the design, fabrication and testing of the hull structure and frame for the PRMS, the US Navy's new Submarine rescue vehicle.

Fabrication Status for the ALVIN RHOV Personnel Sphere

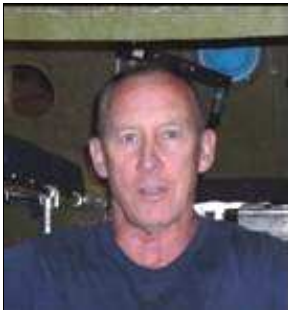
By: Jerry Henkener
Southwest Research Institute, TX, USA
Email: jerry.henkener@swri.org

Woods Hole Oceanographic Institution (WHOI) is developing a new deep diving submersible to ultimately replace the present ALVIN. Southwest Research Institute® (SwRI®) is under contract to WHOI to design, fabricate and test the personnel sphere that will be installed in an upgraded ALVIN submersible. SwRI is nearing completion of the fabrication phase for the personnel

sphere. The personnel sphere will be tested for a 6500 MSW operating depth and it will be dual certified by both ABS and NAVSEA. The final machining of the hatch, hatch seat, window seats and penetrator holes is nearly complete. All of the insert weldments have been completed using Electron Beam (EB) welding and all of the major frame attachment lug weldments have been completed using GTAW. All weldments have been inspected and the personnel sphere has been stress relieved in a vacuum oven in accordance with ABS requirements while experiencing no appreciable distortion or change in out-of-sphericity. After final machining is complete SwRI will complete component assembly and testing leading up to the hydrostatic testing. SwRI expects to deliver the sphere to WHOI after hydro in the late summer of 2011 to complete our contract. The status and activities to complete the personnel sphere will be discussed.

11.00 – 11.30

Kurt Uetz & Anthony Tarantino, Woods Hole Oceanographic Inst.



Kurt Uetz spent 20 years as a Navy officer with tours of duty aboard ships in engineering and operations as well as in shipyards managing shipbuilding and repair projects. He then worked for several years in the telecommunications industry as a project manager, network planner, and operations manager. Kurt is an experienced practitioner in project management as well as teaching college level courses in this discipline. He completed a B.S. in Chemistry, an M.S. in Mechanical Engineering, and holds an M.S. in Project Management.



Anthony Tarantino is an electrical engineer with over 18 years of experience in test, service, and production. Prior to this, he spent 6 years with the Alvin Operations Group as the Electrical Section Leader and completed over 100 dives as an Alvin pilot. He has been with the project since 2007, and has provided technical and programmatic oversight and support.

Status Update for ALVIN Submersible Upgrade Program

Kurt Uetz

Woods Hole Oceanographic Inst., USA

Email: kuetz@whoi.edu

Anthony Tarantino

Woods Hole Oceanographic Inst., USA

Email: atarantino@whoi.edu

Woods Hole Oceanographic Institution (WHOI) is developing a new deeper diving submersible by upgrading the present ALVIN in stages. The upgraded ALVIN will ultimately have an increased operating depth from 4500 MSW to 6500 MSW. The project at WHOI is being accomplished in two phases. The first phase will replace the personnel sphere, the syntactic foam, some of the pressure housings and all of the primary penetrators with new components that will be certified for a 6500 MSW operating depth. The remaining vehicle subsystems will be upgraded or replaced at a later date. The status of the ALVIN upgrade activities and plans for the future upgrade activities will be discussed.

11.30 – 12.00

Daniel Gomez-Ibanez, Woods Hole Oceanographic Institution



Daniel Gomez-Ibanez is an engineer at Woods Hole Oceanographic Institution. He contributed to the design of several underwater vehicles used for ocean science, including the Nereus remotely operated vehicle, autonomous vehicle Sentry and Deep Submergence Vehicle Alvin.

Performance and Safety of Large Format Pressure Tolerant Lithium Ion Batteries for Human Occupied Vehicles

By: Daniel Gomez-Ibanez

Woods Hole Oceanographic Inst., MA, USA

Email: dgi@whoi.edu

Human occupied underwater vehicles demand high density energy storage systems and unconditional safety assurance. A new generation of underwater vehicles replaces present lead-acid batteries with new lithium-ion batteries. For full ocean depth vehicles, large pouch cells are preferred over other types because they can be used safely in a lightweight, pressure tolerant package. Although they have been used in many other applications, performance and safety of these cells in a submarine is not well characterized. What performance can be expected over many deep cycles? What fire barriers are effective? Information from these tests will be used in the future to select cells and design safe battery packages for use in deep submergence vehicles. These tests will provide a benchmark of the present state of lithium ion cell technology. Classification societies, Navy and Coast Guard authorities will benefit from the validation of proposed safety criteria for pressure tolerant pouch lithium ion cells, which will facilitate the integration of similar batteries in classed or approved vehicles.

12.00 – 1.30

LUNCH

1.30 – 2.00

Paul T. Isley III, Rainforest Flora Inc.



Paul T. Isley III is an entrepreneur and adventurer who began his ornamental horticulture business, Rainforest Flora, Inc., 36 years ago. He has authored three large format books one of which “The Deep Voyages To Titanic and Beyond” is the history of much of the evolution of the deep sea submersible world. The experience of researching this project became an experience and opened doors beyond his wildest expectations. Paul spent over two years rewriting and producing this highly acclaimed work by Dr. Anatoly Sagalevich that is an updated version of Russian book, The Deep. There were many consequences that resulted from this project, not the least of which were the warm friendships and acquaintances Paul made with many in the deep-sea community who had worked with and become close to Dr. Sagalevich. Paul is an active member of the Los Angeles Adventurers Club, The Explorers Club and is currently president of the Chicago Adventurers Club (founded by Theodore Roosevelt) celebrating its 100th Anniversary this year.

Diving Lake Baikal, Siberia, with Dr. Anatoly Sagalevich

By: Paul T. Isley III
Rainforest Flora Inc., CA, USA
Email: pti@rainforestflora.com

The two Russian MIR submersibles (MIR 1 and MIR 2) started their third stage of an international research expedition of Lake Baikal. A total of 60 dives were scheduled for 2010 to explore the western, central and southern ends of the lake to explore its fauna, archaeological objects, underwater mud volcanoes and tectonic activity on the lake bottom. In August of 2008, Paul Isley met with Dr. Anatoly Sagalevich and his Russian crew at Lake Baikal where they were escorting scientists to the bottom of the lake. Paul Isley will present his trip and dive with Anatoly in both a PowerPoint presentation and HD video.

2.00 – 2.30

Guillermo Söhnlein, OceanGate



Guillermo Söhnlein is OceanGate's Co-Founder and CEO. He is also Chairman-Elect of the Marine Technology Society's Ocean Exploration Committee. Supplementing his passion for ocean exploration with a passion for space exploration, Guillermo was previously the founder of the International Association of Space Entrepreneurs, an online community focused on promoting global entrepreneurship in space ventures, and Space Angels Network, a national group of accredited investors focused on early-stage aerospace ventures. He has spent over ten years in leadership roles with various early stage technology ventures in Silicon Valley and the Washington DC area. He has consulted extensively with entrepreneurs, startups, angel investor groups, venture capital firms, hedge funds, and nonprofit organizations, and he currently serves on the advisory boards of several technology ventures. Guillermo earned an AB in Economics from the University of California at Berkeley and a JD from the University of California Hastings College of the Law, after which he served on active duty in the United States Marine Corps as a Judge Advocate.

Sea Trials: Lessons Learned During Our First Year Operating Research Submersible Antipodes

By: Guillermo Söhnlein
OceanGate, WA, USA
Email: guillermo@opentheoceans.org

On January 6, 2010, OceanGate took possession of our new manned submersible, Antipodes. An ABS-classed sub capable of taking 5 people to 936 feet, she was perfectly suited to our mission of supporting ocean exploration and marine research. As the third owners of the sub but the first to operate her in U.S. waters and for research purposes, we treaded into unfamiliar waters. One year later, we learned many lessons about successfully operating a submersible as a business venture. The presentation will share experiences, opportunities and challenges faced with technology, staffing, classification, USCG, operations, and business planning. We continue to learn, but ... “if we had only known then what we know now ...”

2.30 – 3.00

Bobby Adams, Director Project Palau



Bobby Adams has been a diver for Offshore Petroleum Divers, McDermott Underwater Services and Cal-Dive International then transitioned to ROVs working for SonSub International. He worked for Deep Marine Technology as a Submersible pilot eventually becoming DOV Director. He now works for C-Innovations overseas.

Chris Hartman, American Aquanauts



Mr. Hartman has on-site, operational level experience on major industrial, scientific and military projects. His assignments: Indo-Pacific - manned submersible diving for NCI seeking medicinal discoveries. Siberia - delivering the largest onshore based directional drilling offshore oilrig and preparing the oilrig Orlan to travel overseas for Exxon Neftgaz. Beaufort Sea - barge master for vessels transporting cargo from the Artic mainland to B.P.'s man-made island Northstar. GOM - subsea construction tasks for B.P.'s Thunderhorse to manned submersible operations investigating the Deepwater Horizon incident. His most recent project: American Aquanaut - a multi dimensional organization paving the way for 21st century "blue jobs". He's a graduate of Marine Diving Technology-Santa Barbara and holds a Bachelor of Science degree in Technology.

Project Palau: Deployment of Manned Submersibles in a Remote Pacific Outpost for Medical Research

Bobby Adams
Dir. Project Palau
Email: seadragon59@gmail.com

Chris Hartman
American Aquanaut
Email: Chris.Hartman@americanaquanaut.com

Join us for a one-hour presentation that will retrace the steps of expedition leaders, scientists, organizations and agencies involved with participating in what set out to be one of the most comprehensive manned submersible expeditions in U.S. history. The presentation will explain the inner workings of critical infrastructure needing to be in place for a successful outcome of a project this scale. Learn from the expedition leaders as they reveal their personal experience about this seven year planned project, what they learned during the year of operation and how to better prepare your expedition for long-term sustainable success.

3.00 – 3.30

COFFEE BREAK

3.30 – 4.00

Scott Cassell, Undersea Voyager Project



Scott has been diving since 1977 and has accumulated over 13,000 hours of dive time. Regarded as an industry leader in Closed Circuit Rebreather technology, Scott is also a USCG Captain and qualified Submersible Pilot. Scott is a qualified Advanced Diving Medical Technician Instructor, Commercial Diving Instructor, and Hyperbaric Medical Technician Instructor at the College Of Oceaneering. He is a U.S. Navy qualified Diving Supervisor, Modular Amphibious Egress Trainer Instructor and Aircrew Breathing Device Instructor for the USMC. He served in both the US Navy and Army, most recently as a MedEvac Helicopter Flight Instructor and Combat Life Saver Instructor. Scott was the first person in the world to film the Giant Squid in the wild (shown on History Channel's Monster Quest). During his 30+ years in the sea he has developed an international project called the Undersea Voyager Project to privatize Ocean Science and empower the people to find out why. Using his submersible to circumnavigate the earth to investigate why the sea is dying, trace the cause and working with an international consortium of scientists place the facts & findings of dives on of weekly & daily global access media like 'You Tube' for the world to see.

Filming Humboldt Squid Behavior Using Red-Light Technology Remotely And With Manned Submersibles

By: Scott Cassell

Undersea Voyager Project, CA, USA

Email: scottcassell@live.com

This paper will present experience and findings of the NATIONAL GEOGRAPHIC Expedition led by the author during March 2010. The CDF&G have disputed eye-witness accounts of commercial salmon fishermen of Humboldt squid (*Dosidicus gigas*) attacking and eating Pacific salmon species. The expedition goal was to film (*Dosidicus gigas*) attacking and feeding on a salmon. Using newly developed hi intensity LED tuned to emit only visible red-light and cameras balanced to the red, the author was able to capture footage of *Dosidicus gigas* eating a placed salmon (in a region no salmon occur naturally) and juvenile shark shapes. Sharks and Tuna are principal predators of *Dosidicus gigas* and with their historical decline due to overfishing the population of *Dosidicus gigas* has exploded and expanded. (Increase Population + Decrease in Biological Boundary {Indigenous Predators} = Geographic Expansion). The footage and observation of *Dosidicus gigas* behavior captured during this expedition validates the fishermen's observations and expresses a great challenge of how to mitigate this new environmental threat.

4.00 – 4.30

Tom McKenna & Tom Dailey, Micropore Inc.



Tom McKenna is VP Sales & Marketing and Tom Daley is technical manager and product specialist at Micropore. Micropore was founded in March of 1997 and manufactures reactive plastics which incorporate various powders into a molded matrix. The company's first product uses a CO2 adsorbent powder which is formed into a cartridge to create a revolutionary CO2 adsorbent system used in rebreathing and life support applications. The patented technology is the first major advance in CO2 adsorbent technology in over 100 years, providing superior performance advantages over existing granular adsorbents. The CO2 adsorbent cartridges are marketed under the ExtendAir brand name and are used for life support in the fire-fighting, medical, dive, submarine and military markets.

Micropore ExtendAIR CO2 Absorbent Life Support Systems

Tom McKenna

Micropore Inc., USA

Email: tom.mckenna@micropore.com

Tom Daley

Micropore Inc., USA

Email: tom.daley@micropore.com

The presentation will discuss new technologies available for life support in manned submersibles. Micropore has developed a new technology of CO2 absorbant materials that provide simple, rugged and effective CO2 scrubbing function. These products have proved to be very effective in emergency situations where long duration scrubbing is required in conditions that may have electric power or not. The new curtain system provides a means to control CO2 levels in a cabin without the need of electrical power. The technology, packaging, operation and specifications of the products will be discussed. A separate workshop will also provide hands-on opportunities to learn more about the function and procedures to use such products.

4.30 – 5.00

Phil Nuytten, Nuytco Research Ltd.



Dr. Phil Nuytten has spent his life in subsea exploration. He has logged many thousands of hours underwater world-wide as a working commercial diver, and as a developer of underwater equipment and techniques. He is widely regarded as one of the pioneers of the modern commercial diving industry and a significant force in the creation of new technology. His goal has been to provide scientific, technical, military, and sport divers full access to continental shelf depths without the hazards of decompression, so that humans can explore, learn about, and - ultimately - protect the world's oceans.



Jeff Heaton is the submersible Operations Supervisor and Chief Submersible Pilot for NUYTCO Research Ltd. Jeff has a BSC in marine biology from the University of British Columbia where he majored in aquaculture. Jeff has worked as a commercial diver for the past 20 years. During his time as a submersible pilot, Jeff has worked with a variety of organizations, including the U.S. Navy, the U.S. Coast Guard, conducted submersible operations for NASA and a variety of media organizations, including the BBC, Discovery Channel and National Geographic.

NUYTCO Overview of Submersible Operations in 2010

Phil Nuytten

Nuytco Research Ltd., Canada

Email: nrl@nuytco.com

Jeff Heaton

Nuytco Research Ltd., Canada

Email: jeff@nuytco.com

The presentation provides an overview of the submersible activity at Nuytco for 2010. The review will include: 1) Delivery of a 1000-foot tourist sub for Curacao, and logging more than 200 dives in the first months. 2) Fullfilment of a multi-year contract with NASA and the Canadian Space Agency in 2010, and training of various astronauts as sub pilots. 3) Deployment of the 'Aquarius' and 'Dual DeepWorker' to perform scientific surveys for the University of California, National Marine Fisheries and NOAA. 4) Start of fabrication of the new Exosuit rated to 1000fsw scheduled for delivery in 2011. 5) Re-certification of a number of DeepWorkers and Dual DeepWorkers submersibles and overhaul of a large North Sea lock-out sub to be rebuilt in 2011. Nuytco was also heavily involved in the 2010 formation of the 'Deep Ocean Group', comprising 28 experts in marine engineering and science assembled to provide technical input to NOAA and the US Environmental Protection Agency on the methodology for control of the BP spill and sub-sea monitoring of the spill effects on the bottom of the Gulf of Mexico.

Day 2

Wednesday 23 February

8.30 – 9.00

Brett Phaneuf, Submergence Group LLC



Brett Phaneuf is president of ProMare, a non-profit organization established in 2001 to promote marine research and exploration throughout the world. ProMare executes a variety of marine research projects independently and in concert with academic, corporate, public and governmental organizations and agencies. ProMare projects are designed to advance man's knowledge of history and science and to reinvigorate underwater exploration through fusion of popular media and scholarly research.

Development and Construction of the FC-01 Submersible

By: Brett A. Phaneuf

Submergence Group LLC, USA

Email: Brett@promare.org

The presentation will discuss design and construction of the FC01, a two-person diesel electric submersible to be operated and stationed in Plymouth and the hull is being built at the MSubs Facility in the UK. Discussion of the design addresses many of the shortcomings of traditional mini-sub. The ability to transit out under diesel power requires good freeboard and stability whilst making the trip enjoyable for two crew. A 200° 'hyper-hemisphere' on the deck provides comfortable car type seating, slightly staggered to make best use of the available shoulder room. The steel hull is designed to BS5500 for a maximum operating depth of 100m to simplify rescue asset requirements. Advanced navigation suite is fitted, GPS whilst on the surface and a 4 beam Doppler velocity log whilst dived that will track to an accuracy of a few meters per hour. A forward scanning sonar is used to locate and film ship wrecks. The sub is due to be launched sometime in 2010.

9.00 – 9.30

Sean Dooley, Nautilus Systems Inc.



Sean Dooley is the Founder of Nautilus, a company that specializes in the design and fabrication of customized breathing gas systems. Nautilus has systems on a majority of the world's largest yachts and, as a result, has been one of the leading companies in introducing submarines to the private yacht market. Nautilus is the exclusive worldwide Sales Agent for GSE and their signature VAS submarine. The VAS submersible is a multi-passenger underwater vehicle built in several configurations, including Diver Lockout, and is capable of a 2000 meter operational depth.

VAS 525 – A 30 year Heritage of Submersible Vehicles with Diver Lockout Capability

by: Sean Dooley

Nautilus Systems Inc., FL, USA

Email: nus2@mac.com

The VAS submarine by GSE opens a world of underwater exploration with full lock-out diving capability. These submarines are adapted to operate from private ships and can accommodate up to 12 passengers depending upon the length and model. Designed for a maximum depth of 525 ft, the VAS submarine is both USCG and CISR compliant and features 96-hours of emergency life support (in addition to it's 8-hour mission time). The VAS minisub offers a range of up to 50 nautical miles at

three knots, or 15 miles at six knots and can be towed on the surface at up to 8 knots. The presentation will review the design features that make this the only recreational submarine that can carry out visual and instrumental searches, as well as the safe launch and retrieval of SCUBA divers. The VAS minisubs are RINA approved and engineered with a combat-proven technology that is continually improved over 30 years of design.

9.30 – 10.00

Zoe Adamedes, BST Systems Inc.



Zoe Adamedes has been working in the areas of manned and unmanned vehicle propulsion for over twenty years. After receiving her Engineering Degree in Chemical Engineering, she began her career at the Naval Underwater Systems Center now NUWEC-Newport RI. For the past 20 years, Zoe has been a Project Engineer and Program Manager at BST Systems Inc, a leading silver zinc manufacturing business located in Plainfield, CT. While at BST Systems, Ms. Adamedes has spent the majority of her time engineering and managing battery systems for manned submersibles, including the DSRV, SDV, ASDS, JMMS, S301 and unmanned submersibles, including the MK30 Mod 2 battery program, SPAT, as well as a specially designed submersible battery for “black ops”. She was also the Program Manager and Project Engineer on the MARS Pathfinder battery program. This silver zinc battery’s performance on the Martian surface so exceeded its mission requirements that BST Systems was awarded the George M. Low Award, NASA’s highest award for quality.

The Evolution of a High Energy Density Silver Zinc Rechargeable Battery: The History of the MK89 Propulsion Cell and Battery and Current Technology Capabilities.

by: Zoe Adamedes

BST Systems Inc., USA

Email: zadamedes@bstsys.com

The silver zinc chemistry has safely and reliably been utilized in many underwater applications over the past 60 years. Its high power, high energy and excellent safety record have made its use most attractive. Although the use of newer chemistries have been considered, recent circumstances have caused the Navy to take a “second look” at this technology. The Navy has selected the MK89 Silver Zinc Battery to power its next generation of wet and dry combat submersibles. The evolution of this cell and battery, its design and capabilities will be presented, along with an overview of silver zinc technology improvement initiatives

10.00 – 10.30

COFFEE BREAK

10.30 – 11.00

Charles Kohnen, SEAmagine Hydrospace Corp.



Charles Kohnen is co-founder and Vice President of SEAmagine Hydrospace Corporation; a manufacturer of ABS classed manned submersibles based in Claremont, California. Mr. Kohnen co-founded SEAmagine with his brother William Kohnen after having spent many years working overseas in the offshore oil service sector for Schlumberger International. SEAmagine performs all its designs in-house and has delivered nine of its vehicles so far which have accumulated over 11,000 dives to date. Charles leads both the market development for the company’s technology as well as the electrical designs of the submersibles under ABS class rules. Mr. Kohnen graduated with an Electrical Engineering and Business Degree from McGill University, Montreal Canada.

SEAmagine Ocean Pearl Submersibles Delivered in 2010

By: Charles Kohnen

SEAmagine Hydrospace Corp., CA, USA

Email: Charles.kohnen@seamagine.com

SEAmagine Hydrospace Corporation delivered its 8th and 9th submersible in 2010 both are 2 person submersibles, classed by ABS, and depth rated to 1250ft (330m). These new generation submersibles have been equipped with a wide range of tools that provide its occupants a powerful 1 atmosphere underwater platform. This presentation will concentrate on the basic overview of the crafts and primarily on the subsea tools that have been selected and how they have been integrated. These include a Fly out ROV with HD camera, a 5 axis manipulator, HD Cameras and HD recording system over fiber-optic inside the hull. Other tools include forward looking sonar, USBL tracking with underwater GPS transmission. An overview will be given on how the human compartment and layout was organized for maximum efficiency.

11.00 – 11.30 Sean Newsome, SeaBotix Inc.



Sean Newsome is the Global Sales Manager for SeaBotix Inc., a San Diego-based manufacturer of remotely operated vehicles. A former nuclear reactor operator for Trident-class submarines, he has more than 16 years of experience in underwater manned and unmanned vehicles and technologies, as well as six years of experience in manufacturing automation.

Applications for ROVs on One Atmosphere Submersibles

By: Sean Newsome

SeaBotix Inc., CA, USA

Email: sean@seabotix.com

Small, one-atmosphere submarines are becoming more prevalent in government, commercial, and personal applications. There are always risks involved with manned submersibles; thrusters and other sensitive control systems can be fouled. Lost fishing nets and natural and manmade physical hazards can entangle the sub making surfacing difficult or impossible. In order to minimize the risk, submarine manufacturers are turning to adding flyout ROVs with specialized rescue functions as a necessary part of the mission toolkit. In addition, an ROV provides an extension of the submarine's capabilities in terms of being able to extend beyond the depth range of the manned component, serve as a second camera system for documentary work, explore the interiors of shipwrecks and natural benthic features such as caves, as well as collect and deliver samples from the surrounding environment to the submarine.

11.30 – 12.00 Jeff Hummel, Rose Point Navigation Systems Inc.



Jeff Hummel is the director of sales and marketing at Rose Point Navigation Systems. Hummel has been extensively involved in PC based navigation systems for the past 25 years. Today the company specializes in navigation software for recreational and professional mariners. Rose Point's innovative software has been enthusiastically received by a growing market and continues its evolution beyond boating towards manned and unmanned vehicles.

NMEA 2000 an Ideal Network for Underwater Applications

By: Jeff Hummel

Rose Point Navigation Systems Inc., WA, USA

Email: Jeff@rosepointnav.com

NMEA 2000 is an ideal instrumentation network for underwater applications. The system is based on the Controller Area Network (CAN) architecture that supports both power and data on the network. Users can add the NMEA 2000 network to a submarine or ROV to easily acquire and display information as well as control motors and powered circuits. Off the shelf software and hardware are available and can be easily customized to meet various system requirements. Industry standards and wide acceptance has resulted in highly reliable, low costs solutions.

12.00 – 1.30

LUNCH & MOVIE

12.30 – 1.15

Greg Mikolasek, In-Depth International Inc.



Gregg has more than 25 years of diving and maritime experience. He holds two degrees from the University of Michigan, including a Masters in Atmospheric and Oceanic Science. A Dive Instructor since 1997, he holds the rating of Master Diver Trainer. His diving experience ranges from recreational to technical and light commercial, including videography at technical depths as well as stunt diving. Since 2000, he has been a remote sensing consultant and Project Director, employing sidescan sonar in a number of underwater searches. Gregg is a certified EMT, licensed private pilot, skydiving coach, and holds a 100GT US Coast Guard Captain's License. In 2007, Gregg visited Mongolia on a diving expedition to Lake Khovsgol, performed a sonar survey of several shipwrecks and later co-wrote a television documentary about the region, focusing on its preservation.

Diving in Mongolia: Adventures in the Land of Chinggis Khan Over, Under & Across Mongolia

By: Greg Mikolasek

In-Depth International Inc., USA

Email: scanman@indepthconsulting.com

Join us for a photo journey across, above and under Mongolia. In 2007, Gregg Mikolasek had the opportunity to take part in the first ever diving expedition to Lake Hovsgol, a high altitude lake in outer Mongolia representing more than 1% of the Earth's fresh water supply. This resulted in the production of the 2009 documentary 'Hovsgol Nuur: Diving in the Land of Chinggis Khan'. On a return trip to the region in 2010 by (very) small truck, Gregg had the opportunity to experience Mongolia in a way few have, by driving there from England! Whether it was jumping out of Russian helicopters with the Mongolian Special Forces, talking his way out of bribes to officials inventing new traffic laws, or exploring shipwrecks 1000 miles from the nearest ocean, Gregg always tried to have his camera ready to capture the moment on film. Bring your lunch and join us for this very informal look at life, gravity and diving on the other side of the planet. Towards the end of the presentation, Gregg will also touch on his company's plans for a return trip to Lake Hovsgol to take on some challenging environmental work with the Mongolian Government.

1.30 – 2.00

Lorri A. Bennett, Applied Research Lab, Penn State Univ.



Lorri Bennett is a research engineer in the Manufacturing Technology Division at the Applied Research Lab (ARL) at Penn State. Her specialty is in the development of advanced concept assessment tools, trade space exploration methods and design automation. For the past 10+ years she has focused on the development of conceptual design environments for complex engineering systems, performing trade studies in support of these applications, and advanced data exploration methods. She has experience in a broad range of application areas, including undersea vehicles, undersea weapons, manned submersibles, space systems and ground combat vehicle systems. She has been the project lead on numerous government sponsored research projects, including efforts for NAVSEA, the Office of Naval Research and the Marine Corps. For the past several years she has lead multiple studies involving manned submersibles, including cost benefits analysis and cost benefits trade space exploration. In these efforts her team developed a cost and capability trade study model for NAVSEA which is being used to explore trends between requirements, technologies and acquisition costs of manned submersibles.

Studying the Cost of Navy Certification on Manned Submersibles

By: Lori Bennett

Applied Research Lab, Penn State University, USA

Email: lab27@arl.psu.edu

The Applied Research Laboratory (ARL) at Penn State under direction by NAVSEA was tasked to investigate the perception that the cost, time, and effort required to certify manned combatant submersibles to Navy standards was unnecessarily expensive. To shed light on this perception, ARL attempted to identify the costs of certification on Navy Deep Submergence Systems, determine if these costs are excessive, and the underlying cause. The original goal of this work was to survey Navy DSS programs and to identify costs which were associated with the Navy certification process. However, program unique issues limited the platforms available for cost consideration, and the lack of details in the cost data that could be acquired prevented isolation of certification costs. Yet, with input from industry and Navy representatives, key process differences were identified between commercial classification and the Navy certification requirements; costs of manned submersibles were decomposed into more discrete cost categories; the cost differences between a Navy certified rescue vehicle and a commercially classed vehicle of similar function were investigated; and recommendations were provided for isolating Navy certification costs and reducing costs on Navy DSS programs. This presentation will provide an overview of the Study of the Cost of Navy Certification, the study methodology, cost data collection and analysis challenges, and the final study results and recommendations..

2.00 – 3.00

Alfred H. Ford, Naval Sea Systems Command



A 1971 engineering graduate of the University of South Carolina, Mr. Ford served in various technical, supervisory and managerial positions, including Submarine Safety Program Director, at Charleston Naval Shipyard in Charleston, SC. In 1993 he moved to the Naval Sea Systems Command in Washington, DC to become the Safety and Quality Assurance Manager for construction of SEAWOLF Class submarines. This was followed in 1996 with an assignment as the senior civilian responsible for managing the Navy's Safety and Quality Assurance Programs for all submarines and deep submergence systems. In 2010 Mr. Ford assumed the role of senior advisor to the Undersea Warfare Directorate on matters of submarine and deep submergence systems safety, quality assurance, and certification.

The US Navy's Deep Submergence Systems Safety Certification Program

By : Alfred H Ford PE

Submarine Safety & Quality Assurance

Naval Sea Systems Command, USA

Email : Alfred.ford@navy.mil

The principal objective of this audio visual presentation is to provide participants an overview of the U.S. Navy's Manned Deep Submergence Systems Program and the Navy's approach to manned deep submergence systems safety. The events leading to the inception of the program will be discussed as well as a history of the program, including mishaps and how they shaped the program. The Navy's System Certification Procedures and Criteria Manual for Deep Submergence Systems will be introduced and a synopsis of each chapter will be provided. The Navy's fundamental principles for safety certification of manned deep submergence systems will be reviewed and key terms will be defined, such as "Certify", "Deep Submergence System", "Scope of Certification", "OQE", "Re-entry Control", "Functional Audits" etc. Navy requirements for systems design, material control, fabrication, testing, operational procedures, emergency procedures, and maintenance procedures will be addressed. The Navy's Deep Submergence System safety certification process and its flexibility will be outlined, including the importance of objective quality evidence in the process. Requirements and procedures for initial certification and sustaining certification throughout the life cycle of a deep submergence asset will be summarized. The Navy desires to familiarize the maritime industry with Navy procedures and criteria for its deep submergence systems in order to broaden the base of potential providers in the private sector.

3.00 – 3.30

COFFEE BREAK

3.30 – 4.00

Roy Thomas, ABS Americas



Roy Thomas is a Senior Engineer with the American Bureau of Shipping (ABS), Houston, TX. He has worked with ABS for the past 8 years and specializes in the design review of mechanical equipment and underwater vehicles and systems. He has served as the lead engineer for various underwater projects and has reviewed the designs of numerous underwater vehicles and systems. Prior to joining ABS he worked as a seagoing marine engineer. Mr. Thomas is the author of various technical papers and Rule changes. He is an active participant on various industry committees including the ASME Committee on Pressure Vessels for Human Occupancy. Over the last few years, he has been conducting the annual ABS - Industry meeting at the Underwater Intervention Conference in New Orleans. He also serves as an instructor for the course "Classification of Submersibles" conducted by the ABS Academy. Mr. Thomas holds a master's degree in Naval Architecture from Memorial University of Newfoundland (MUN), Canada and a bachelor's degree in Marine Engineering from Marine Engineering and Research Institute (MERI), India.

ABS Proposed Rule Changes Overview for 2011

By: Roy Thomas

ABS Americas, Houston, TX, USA

Email: rthomas@eagle.org

Open meeting of the American Bureau of Shipping (ABS) with the subsea industry to review proposed rule changes to the ABS Rules for Building and Classing Underwater Vehicles, Systems and Hyperbaric Facilities, 2010. The proposed rule changes address the following areas:

- New Definitions
- Gas Reclaim Systems
- Internal Combustion Engines
- Lock-Out Submersibles
- Diving Systems
- Batteries

The meeting facilitates an open dialogue with the industry on current issues that work well or do not work. All active designers, fabricators, owners and operators are invited to attend and provide feedback.

4.00 – 5.00

OPEN DISCUSSION

Roy Thomas, ABS Americas

Alfred H. Ford, NAVSEA

Lorri Bennett, ARL, Penn State

Day 3

Thursday 24 February

8.30 – 9.00

Jon Wallace, P-Subs Organization



Jon Wallace co-founded PSUBS in 1996 and leads the organization today. He is employed as a software engineer for Hewlett-Packard and was an elected official in local government for 13 years before retiring from politics in 2003. Jon is responsible for setting goals and direction, public relations, and liaison to private, business, and government entities. He provides software and technical support for the website and mailing list, and helps coordinate PSUBS conventions. He is an open-water PADI certified diver and his interest in submersibles is for exploration of the undersea world at depths and durations not possible with SCUBA.

PSUBS – Personal Submersibles Organization Overview

By: Jon Wallace

P-Subs Organization, USA

Email: Jonw@psubs.org

This presentation will provide an update of PSUBS (Personal Submersibles Organization) activities for the past two years including various submarine and electronic projects under development, organization roadmap and interaction with other industry organizations, and technical issues we have addressed as a group.

9.00 – 9.30

Simon Lunt & Michelle Hudson, Analox Sensor Technologies



Simon Lunt is Sales Manager for Analox Sensor Technology, who have provided gas analysers to the offshore industry since 1981. Previously, Simon was an Internal Sales Manager for a the UK's leading Health & Safety Supplies company.

Michelle Hudson is Account Manager for Analox Sensor Technology, who have provided gas analysers to the offshore industry since 1981. Previously an ICT/network specialist and Regional Account Manager for a UK based audio visual company.



Atmosphere Monitoring for Manned Submersibles

Simon Lunt

Analox Sensor Technologies Ltd., UK

Email: simon.lunt@analox.biz

Michelle Hudson

Analox Sensor Technologies Ltd., UK

Email: michelle.hudson@analox.biz

Space and Life Support monitoring are two of the prime design drivers in any submersible cabin. The Analox Sub Aspida is a purpose designed compact portable gas monitor capable of detecting both carbon dioxide (CO₂) and oxygen (O₂). The unit offers continuous monitoring of partial pressure O₂ and volumetric CO₂, making it ideal for confined space entry onboard submarines and monitoring of portable or transportable decompression chambers. The presentation will describe the features and attributes of this new configuration and offer an overview of its full range of capabilities.

9.30 – 10.00

Mitchell Brook, Luce, Forward, Hamilton & Scripps LLP



Mitchell Brook is an Intellectual Property partner in the law firm of Luce, Forward, Hamilton & Scripps. He represents established companies, as well as emerging companies, on strategic issues concerning technology enforcement, development and branding. This includes developing patent and trademark strategies, preparing and prosecuting U.S. patents, trademarks, and foreign equivalents, technology licenses and other transactions. He has an international perspective with expertise in emerging and established markets. Mr. Brook serves on the Boards of Directors of The Security Network and of the MIT Enterprise Forum of San Diego.

Protecting Intellectual Property Around the World

by: Mitchell Brook Esq.

Luce, Forward, Hamilton & Scripps LLP, USA

Email: Mbrook@luce.com

Where there is innovation and creativity, intellectual property rights are created. These rights include patents, trademarks, and copyrights. Developing a business strategy for protecting these rights, as well as avoiding infringing the rights of others is part of a growth strategy expected by investors. Mitchell Brook, is a partner in a leading law firm, and has developed IP strategies for emerging companies and already established companies.

10.00 – 10.30

COFFEE BREAK

10.30 – 12.00

MUV TECHNOLOGY PANEL DISCUSSION

Kevin L. Cook, CIV NAVSEA HQ, NAVSEA 05



Mr. Cook has spent 30 years as a Navy civilian in numerous marine engineering and management assignments. In 1987 Mr. Cook moved to the Naval Sea Systems Command to join the newly formed Submarine Safety (SUBSAFE) Office. In this position he was responsible for SUBSAFE Manual requirements and P-9290 (Deep Submergence Systems) certification. He also managed the associated audit and quality assurance programs. In 2007 Mr. Cook was assigned as Technical Director of NAVSEA PMS394 (Deep Submergence Systems Acquisition Office). Finally, in 2010 Mr. Cook was selected to establish the High Energy Chemical Storage Safety Office (HECSSO) under the Chief Engineer of the Navy (SEA 05Z). This new safety program is charged with safe platform integration of lithium batteries, fuel cells, and other high density energy systems on ships and submersibles. Mr. Cook has a BS degree in Mechanical Engineering and a MS degree in Mechanics.

Brent Perry, Corvus Energy Ltd



Brent Perry is a global operating and management executive who's successful at building high-performance teams and leading sophisticated manufacturing and service organizations. His history in designing, engineering and manufacturing ships and yachts from 32 to 164 feet in length have developed an understanding of the demands and expectations of commercial and industrial marine applications within the marine industry, and these expectations are what have driven the business and engineering model of Corvus Energy Ltd. Corvus Energy Batteries represent the next level of energy supply that will change the face of how the submersible marine industry develops over the next twenty years

David White, Southwest Electronic Energy Group



David White graduated from Texas A& M University in 1970 with a BS in Electrical Engineering. David has been designing state-of-the-art computer, seismic, and battery systems for Texas Instruments, Halliburton, Input/Output, Southwest Electronic Energy Group, and others for over 40 years. David's practical design experience is in large, high capacity, high reliability computer and system designs used in battery operated, man portable applications. David is named with other colleagues at SWE on 6 patents covering inventions for Continuous Cell Balancing Methods & Module Balancing Methods for extending Li-Ion battery life, reliability, and safety. David is an emeritus member of the Society of Exploration Geophysics and a Life Senior member of the IEEE and has been recognized during his employment at Texas Instruments, as a Texas Instrument's Senior member of Technical staff.

TECHNICAL PANEL DISCUSSION

Technology Panel Discussion: High Energy Density Battery Systems for Manned Submersibles

- Chaired by: Will Kohnen, MUV
- Panelist No. 1: Brent Perry, CEO, Corvus Energy
Email: Bperry@corvus-energy.com
- Panelist No. 2: Kevin Cook, CIV NAVSEA HQ, NAVSEA 05
Email: Kevin.L.Cook@navy.mil
- Panelist No. 3: David White, Southwest Electronics Energy Group
Email: dwhite@swe.com
- Panelist No. 4: Zoe Adamedes, BST Systems Inc.
Email: ZAdamedes@bstsys.com
- Panelist No. 5: Daniel Gomez-Ibanez, Woods Hole
Email: dgi@whoi.edu
- Panelist No. 6: Roy Thomas, ABS America.com
Email: rthomas@eagle.org

Sponsored by the MTS Manned Underwater Vehicles committee, the Technology Panel in 2011 will discuss the challenges involved in design, development, safety and regulatory approval of high energy density battery systems. A number of commercial, research and government organizations present the art of the possible viewed from different points of view.

1. CORVUS ENERGY will present technology history, engineering heritage and existing applications of Lithium based battery systems. The presentation will offer new solutions for subsea applications, address safety and regulatory issues and elaborate on its consortium and collaborative engineering approach.
2. NAVSEA has a broad experience in designing and utilizing Lithium based battery systems. The presentation will provide an overview of present NAVSEA certification requirements and control protocols and expand on the safety challenges remaining to bring the technology to main stream commercial use.

3. BST Systems produces Silver Zinc battery systems, which have been and continue to be in use with a wide range of applications, including Sub Sea systems. The earlier presentation in the program will provide a reference point for setting a benchmark and expand the discussion beyond the boundaries of Lithium technology.
4. WHOI is planning the development of ambient pressure Lithium Ion batteries for the New ALVIN. The earlier presentation in the program discussed possible solutions and test protocols to generate an industry recognized safety validation for such batteries by pursuing an ABS approval procedure for such technology.
5. ABS supports an ever growing range of technologies as they apply to manned submersibles through their Rules and Standards for Building and Classing Manned Underwater Vehicles. ABS is the main regulatory authority to establish the safety of such batteries in commercial and private submersible applications by creating and adopting a new set of rules regarding Lithium batteries.

12.00 – 1.30

LUNCH

1.30 – 3.00

MTS MUV Committee Meeting

**MARINE TECHNOLOGY SOCIETY
MUV ANNUAL COMMITTEE MEETING**

Chair: William Kohnen
Email: will.kohnen@seamagine.com

Co-Chair: Vance Bradley
Email: vbra676539@aol.com

Secretary: Daniel Lance
Email: lanceind@gmail.com

Annual meeting of the MTS MUV committee. Annual review of 2010 and objectives for 2011. All subsea community members are invited to attend and help grow the organization of the Manned Underwater Vehicles world for its board structure, conference planning, web site content, regulatory discussions and industry support resources.

WORKSHOPS

Wednesday 23 February

9.00 – 10.00

MICROPORE INC.

ROOM 214

Micropore ExtendAIR CO2 Absorbent Life Support Systems

Tom McKenna

Micropore Inc., USA

Email: tom.mckenna@micropore.com

Tom Daley

Micropore Inc., USA

Email: tom.daley@micropore.com

WORKSHOP: Micropore will present a new line of CO2 absorbant products, the ExtendAir curtains, which have proved to be very effective in emergency situations where long duration scrubbing is required in conditions that may have electric power or not. The new curtain system provides a means to control CO2 levels in a cabin without the need of electrical power. The technology, packaging, operation and specifications of the products will be discussed and also provide hands-on opportunities to learn more about the function and procedures to use such products.

10.30 – 11.30

ANALOX SENSOR TECHNOLOGIES

ROOM 214

Atmosphere Monitoring for Manned Submersibles

Simon Lunt

Analox Sensor Technologies Ltd., UK

Email: simon.lunt@analox.biz

Michelle Hudson

Analox Sensor Technologies Ltd., UK

Email: michelle.hudson@analox.biz

WORKSHOP: Space and Life Support monitoring are two of the prime design drivers in any submersible cabin. The Analox Sub Aspida is a purpose designed compact portable gas monitor capable of detecting both carbon dioxide (CO2) and oxygen (O2). The unit offers continuous monitoring of partial pressure O2 and volumetric CO2, making it ideal for confined space entry onboard submarines and monitoring of portable or transportable decompression chambers. The presentation will describe the features and attributes of this new configuration and offer an overview of its full range of capabilities.

Thursday 24 February

8.30 – 10.30

INNERSPACE CORPORATION

ROOM 211

Innerspace Thruster Maintenance Workshop

By: Omar Rafeh

Engineering Manager

Innerspace Corporation, USA

Email: omar@innerspacethrusters.com

WORKSHOP: This is a training course aimed at raising the general level of understanding of underwater thrusters and to gain the specific knowledge needed to take full advantage of the advanced features of Innerspace's products. The workshop will demonstrate how to take apart and to rebuild a 1002 Hydraulic Thruster with motor. All tools and instructions will be provided. Participants will have the chance to do hands-on work and practice.

**UNDERWATER INTERVENTION 2011
3-DAY TECHNICAL PROGRAM SCHEDULE**

DAY 1 - UI 2011 TECHNICAL PROGRAM SCHEDULE						
TUESDAY Feb. 22, 2011	Room 201/202 Cable & Connectors	Room 203-205 SWOROV	Room 206 MUV	Room 210 DIVING	Room 211-213 Marine Struc. Ocean Engr	Room 214 MOORINGS
8:30-9:00	CC1 Kevin Comer, Harris Corp.	SWOROV1 R.Z. Miller, Rozalia Project	MUV1 empty	DIV1 Dennis G. Gallagher, N.S.War Panama City	MARSTR1 P.W. Marshall, Chair, MTS Offshore Str.	MOOR1 C.Barrera, Pataforma Oceanica de Canaria
9-9:30	CC2 B Fisher, D Jenkins, Brantner-SeaCon	SWOROV2 Bengt Sahlberg, LYNN AB	MUV2 W. Kohnen, SEAmagine Corp Chair, MTS MUV	DIV2 Bill Crowley ADCI	MARSTR2 C. Barrera, Head. VIMAS	MOOR2 C.Barrera, Pataforma Oceanica de Canaria
9:30-10	CC3 Craig Kohler, NOAA	SWOROV3 B. Luzzi, VideoRay, C. Thomgren, SRIS		DIV3 R. Morales-Garcia		
10-10:30	Break	Break	Break	Break	Break	Break
10:30-11	CC4 Lex LeBlanc, Natl Data Buoy Ctr	SWOROV4 A. Goldstein, VideoRay LLC	MUV4 J. Henkener, SWRI	DIV4 M. Boudreaux, Mireaux Mgmt Solutions	MARSTR4 P.W. Marshall, Chair MTS Offshore Structures Committee Meeting	MOOR4 D. Stromberg, Collins Engr S.A. Cohen, NFESC WA
11-11:30	CC5 Rodney Riley, Natl Data Buoy Ctr	SWOROV5 R. Batey, Zulu Marine Services	MUV5 K.Uetz, A.Tarantino WHOI	DIV5 Rick Lesser, Lesser & Assoc		MOOR5 R. Haun, R. Hall, DCL Engineered Solutions
11:30-12	(CC6)	SWOROV6 T. Wrasse, WI Dept of Natural Res.	MUV6 D. Gomez-Ibanez, WHOI	DIV6		MOOR6 F. Murdock, TMT Labs
12:00-1:30	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
1:30-2	MTS Cable & Conn. Committee Mtg Helmut Portmann, NOAA, Chair	SWOROV7 L. Thompson, BlueView Technologies	MUV7 Paul Isley, Botanical Press	DIV7 Mike Langen, Global Diving & Salvage	OE1 I. Florence, Kongsberg Maritime	MOOR7 Jack Rowley, Chair MTS Mooring Committee Meeting
2-2:30		SWOROV8 Mark Klein, S.T. Hudson Engrs	MUV8 Guillermo Söhnlein, OceanGate	DIV8 T. Alleman, J. Serio, Dr. B. Bourgeois	OE2 S. Hart, Polymer Corp	
2:30-3		SWOROV9 Dr Jeremy Frank, KCF Technologies	MUV9 B. Adams, C. Hartman	DIV9	OE3 I. Tena & J. Wood	
3-3:30	Break	Break	Break	Break	Break	Break
3:30-4	empty	SWOROV10 J. Stewart, Kent City EMC G. Szotko, Grand Rapids	MUV10 S. Cassell, Undersea Voyager Proj.	DIV10 S Lunt, M Lewis Analox Sensor Tech.	OE4 J. Garrington, Shark Marine Tech.	empty
4-4:30	empty	SWOROV11 T. Wrasse, WI Dept of Natural Res.	MUV11 T.McKenna, T.Daley Micropore Inc.	DIV11 S Lunt, M Lewis Analox Sensor Tech.	OE5 J. Seawall, BlueView	empty
4:30-5	empty	SWOROV12 Jeff Conger, SeaBotix	MUV12 P. Nuytten, J. Heaton Nuytco Research Ltd.	DIV12 S Lunt, M Lewis Analox Sensor Tech.	OE6 S.Ingle, K.du Vall, J.Snider, K.Juntunen, Lighthouse R&D Enterprises	empty

**UNDERWATER INTERVENTION 2011
3-DAY TECHNICAL PROGRAM SCHEDULE**

DAY 2 - UI 2011 TECHNICAL PROGRAM SCHEDULE						
WEDNESDAY Feb. 23, 2011	Room 201/202	Room 203-205	Room 206	Room 210	Room 211-213	Room 214
	ROV	SWOROV	MUV	DIVING	SONAR, EDU	UNASSIGNED
8:30-9:00	ROV1 W.S. Averill, W. S. Waters, Oceaneering Int'l	SWOROV13 Don Draper, T&T Marine	MUV13 B.A. Phaneuf, Submergence Group LLC	WRKSHP1 Justus Mills, Stanley Hydraulic Tools	empty	empty
9-9:30	ROV2 L.Taylor, I. Griffith, B. Rosenthal, DOER	SWOROV14 I. MacDonald, Buccaneer Ltd	MUV14 Sean Dooley, Nautilus Systems	WRKSHP1	TUT1: Sonar Basics Mark Atherton, Kongsberg Marine	WRKSHP 3A T. McKenna, T. Daley Micropore Inc.
9:30-10	ROV3 J. Epstein, G. Hawkes, Hawkes Remotes	SWOROV15 S. Van Meter, Van Meter Consulting	MUV15 Zoe Adamedes, BST Systems Inc	WRKSHP1	Mark Atherton, Kongsberg Marine	WRKSHP3A
10-10:30	Break	Break	Break	Break	Break	Break
10:30-11	ROV4 J. Kamentser, Bokam Engineering	SWOROV16 B. Langeland, Stinger Technology AS	MUV16 C. Kohnen, SEAmagine Hydro. Corp	WRKSHP2 Steven Lupien, Five Star Marine	TUT1: Sonar Basics Mark Atherton, Kongsberg Marine	WRKSHP 3B S. Lunt, M. Hudson, Analox Sensor Technology
11-11:30	ROV5 C. Poissonnet, ROS	SWOROV17 A. Goldstein, VideoRay	MUV17 Sean Newsome, SeaBotix	WRKSHP2	Mark Atherton, Kongsberg Marine	WRKSHP3B
11:30-12	ROV6 D. Robinson, CodaOctopus Products	SWOROV18 J. Kasznic, ReefBot	MUV18 J. Hummel, Rose Point Nav. Sys.	WRKSHP2	Mark Atherton, Kongsberg Marine	empty
12:00-1:30	Lunch	Lunch	Lunch at the Movies Expedition to Mongolia G. Mikolasek	Lunch	Lunch	Lunch
1:30-2	ROV7 L. Goldberg	SWOROV19 S.Van Meter, Van Meter Consulting	MUV19 L. Bennett, Applied Research Lab	DIV19 Saul Rosser, UNCW	TUT1: Sonar Basics Mark Atherton, Kongsberg Marine	empty
2-2:30	ROV8 E. Moreno	SWOROV20 M. Klein, S.T. Hudson Engrs	MUV20 A.H. Ford, NAVSEA, U.S. Navy	DIV20 T. Cauty, Cauty Process Technology	Mark Atherton, Kongsberg Marine	empty
2:30-3	ROV9 J. Davies, Global Marine Systems	SWOROV21 C. Thorgren, Submerged Recovery & Insp Services	MUV21	DIV21 L. Leaney, HDS	Mark Atherton, Kongsberg Marine	empty
3-3:30	Break	Break	Break	Break	Break	Break
3:30-4	ROV10 Drew Michel, Chair	SWOROV22 W. Stoner, A-T Solutions, Inc.	MUV22 R. Thomas, ABS Americas	DIV22 Dr. B. Bourgeois	EDU1 Jill Zande, MATE Center	empty
4-4:30	MTS ROV Committee Meeting	SWOROV23 empty	MUV23 ABS Open Discussion	DIV23 Dr. S. Parks	EDU2 S. L. Cook, Gulf SERPENT Project	empty
4:30-5		SWOROV24 empty	MUV24 ABS Open Discussion	DIV24 empty	EDU3 Erica Moulton, MATE Center	empty

**UNDERWATER INTERVENTION 2011
3-DAY TECHNICAL PROGRAM SCHEDULE**

DAY 3 - UI 2011 TECHNICAL PROGRAM SCHEDULE						
THURSDAY Feb. 24, 2011	Room 201/202 UMV	Room 203-205 Shipwreck / Deep Ocean Mining	Room 206 MUV	Room 210 DIVING	Room 211-213 THRUSTERS	Room 215-216 OCEAN EXPLOR
8:30-9:00	UMV1 B. Bourgeois, S. Zambo, NRL	SW1 M. Gleason, Great Lakes Museum	MUV25 J. Wallace, P-Subs Organization	DIV25 empty	WRKSH4 Omar Rafah, Engineering Manager, InnerSpace Corp. WRKSH4	empty
9-9:30	UMV2 D.L. Brandon Jr., D. Bourgeois, NRL	SW2 D. L. Mearns Blue Water Recoveries Ltd.	MUV26 S. Lunt, M. Hudson, Analox Sensor Tech.	DIV26 empty		OCEAN EXPL Guillermo Sohnlein Chair
9:30-10	UMV3 C.L.Frey, A. Sherrell, HBOI, J.Marshall, U. Queensland	SW3 E. Gerth, Odyssey Mar. Exploration	MUV27 M. Brook Esq., Luce, Forward, H&S	DIV27 A. G. Mary, P. Madhupal, HMR Env. Engr Consultants		MTS Ocean Exploration Committee Meeting
10-10:30	Break	Break	Break	Break	Break	Break
10:30-11	UMV4 M. W. Roe, Brian Bourgeois, NRL	SW4 PANEL O. Varmer, NOAA C. Davino, RMST M. MacConnel, Odyssey D. Bederman, Odyssey J. Sinclair, ProMES	MUV28 PANEL B. Perry, Corvus Ener K. Cook, NAVSEA 05 D. White, SWE D. Gomez-Ibanez, WHOI Z. Adamedes, BST Sys R. Thomas, ABS	DIV28 David DeVilbiss	empty	empty
11-11:30	UMV5 E. Hudson, iRobot Corp			DIV29 N. Michelsen, MIKO Technology	empty	empty
11:30-12	UMV6 R. Mandujano, Vehicle Control Tech.			DIV30 Jack Couch OI	empty	empty
12:00-1:30	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
1:30-2	UMV7 W. O'Halloran, Bluefin Robotics	DOM1 R. Truman, Odyssey Marine Exploration	MUV31 Will Kohnen Chair MTS MUV Committee Meeting	DIV31 C. Peppler	empty	empty
2-2:30	UMV8 M. Rapa, Scripps Inst. Oceanography	DOM2 C. Mullen, Aurora Trust		DIV32 PANEL DISCUSSION Bill Folse Jerry Zebor Scott Croft	empty	empty
2:30-3	UMV9 I. Tuphanov, Inst. Marine Technology Problems, M. Denisenko, Far-East Federal Univ, Russia	DOM3 D. R. Cullimore, Droycon Bioconcepts		empty	empty	
3-3:30	Break	Break	Break	Break	Break	Break
3:30-4	UMV10 Andy Sherrell, HBOI	empty	empty	DIV34 P. Newsom Exec Dir, ADCI	empty	empty
4-4:30	UMV11 Peter Brickley, Horizon Marine	empty	empty	DIV35 empty	empty	empty
4:30-5	UMV12 R. Mandujano, Chair MTS UMV Committee Meeting	empty	empty	DIV36 empty	empty	empty

NOTES

**MARINE TECHNOLOGY SOCIETY
MANNED UNDERWATER VEHICLES COMMITTEE**

Chairman William Kohnen
SEAmagine Hydrospace Corp.
Tel. (909) 626-6262
Mob. (951) 323-5377
Email: will.kohnen@gmail.com

Co-Chair Vance Bradley
Email: vbra676539@aol.com

Secretary Daniel Lance
Lance Industries
Email: lanceind@gmail.com

Treasurer open position

Web-Site Jay Wade
www.jaywade.com
Email: jay@jaywade.com

Committee Web Site: www.mtsmuv.org

ANNUAL Meeting: MTS MUV Committee Meeting
Thursday, Feb. 24th
1:30PM - Room 206

**MARINE TECHNOLOGY SOCIETY
OCEAN EXPLORATION COMMITTEE**

Chairman Guillermo Söhnlein
OceanGate
Cell: (703) 346-3041
Email: guillermo@opentheoceans.org

Co-Chair Open Position

Secretary Open Position

Treasurer Open position

ANNUAL Meeting: Ocean Exploraqtion Committee Meeting
Thursday, Feb. 24th
9:00AM - Room 215/216



Corvus Energy



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