



## PLANERY SESSION – GUEST SPEAKER

**Dr. Anatoly Sagalevitch**  
Head of Deep Manned Submersibles Laboratory  
P. P. Shirsov Institute of Oceanology  
Russian Academy of Sciences  
Moscow

## SESSION A1 – Manned Submersibles Overview (Monday Feb 14, 10:00-11:30PM)

### 1. NOAA Office of Ocean Exploration Use of Manned Submersibles in 2004/2005

John McDonough / Justin Manley  
NOAA Ocean Exploration Office  
Silversprings, MD USA

*A Review of NOAA's Office of Ocean Exploration Activity in 2004 - 2005 using manned submersibles. Deep submergence expeditions using ALVIN for the Gulf of Alaska Seamount Expedition, Johnson Sea Link for multiple Expeditions from Florida to North Carolina, and PISCES IV & V for Deep Sea Precious Corals observation in the Hawaiian Archipelago.*  
Email: john.mcdonough@noaa.gov

### 2. Manned Submersible Activity 2004 – An Overview of Active Submersibles

William Kohnen, Chair  
MTS Manned Underwater Vehicle Committee  
Claremont, CA USA

*An introductory presentation summarizing the main events during 2004 using manned submersibles. This is a compilation of material submitted by all industry members and is meant to provide an overview of manned submersible activity around the globe.*  
Email: will.kohnen@seamagine.com

## SESSION A – Manned Submersibles: Past & Present (Monday Feb 14, 1:30-3:00PM)

### 3. Deep Ocean Simulation Lab Facilities for Submersible Testing in California and Texas

William Kohnen, President  
SEAmagine Hydrospace Corp.  
Claremont, CA USA

*Present an overview of deep ocean simulation test facilities available for hydrostatic pressure testing of submersible hulls as used by SEAmagine for testing SEAmobile #5 and #6 in 2004. Reviews the capabilities of the Test facilities at NFESC (Naval Facilities and Engineering Support Center) in Port Hueneme, California, which operates a 72 inch diameter test tank as well as the test facility at Southwest Research Institute in San Antonio, Texas.*  
Email: will.kohnen@seamagine.com

**4. Recent DSPA Activities and a Review of Submersible Accidents**

Capt. Charles MacVean, USN Retired  
Deep Submergence Pilot Association  
San Diego, CA USA

*The Deep Submergence Pilot Association is a unique organization in the country that is dedicated to the stewardship of knowledge and experience in dealing with deep submergence manned submersibles. The presentation will review the latest activities of the DSPA and provide information on its calendar of events, services and resources. The presentation will also review and discuss a series of manned submersible accidents over the past 40 years, to highlight the lessons learned and how these have all contributed to the codes and standards used today.*

*Email: crmacvean@msn.com*

**5. CEN 14931 – A Process of development and content of the brand new European Standard regarding Hyperbaric Chambers**

Harald Pauli  
Germanischer Lloyd AG  
Hamburg, Germany

*Following the hyperbaric chamber fire accident in Milan, Italy, the European Community lead the effort to generate safety standards for the design and operation of such facilities. Germanischer Lloyds was selected as technical lead and the paper presents the finding and guidelines adopted for consideration as the new European Standard.*

*Email: pau@gl-group.com*

**SESSION B – National Deep Submergence Programs  
(Monday Feb 14, 3:30 – 5:00PM)**

**6. National Deep Submergence Facility Replacement for ALVIN**

Robert Brown  
Woods Hole Oceanographic Institution (MS #17)  
Woods Hole, MA USA

*The National Deep Submergence Facility has funded by the National Science Foundation to commence the process of replacing the ALVIN with a new deep submergence vehicle. The new vehicle would dive deeper (6500 meters), have improved observer and pilot viewing, a larger interior volume with improved ergonomics, greater battery capacity and improved endurance, and less reliance on disposable weights and hazardous materials. The presentation will discuss the current plan for design and construction of this vehicle.*

*Email: rbrown@whoi.edu*

**7. Development of Lithium-Ion Battery for DSV “Shinkai 6500”.**

Mr. Itaru Kawama  
JAMSTEC, Japan Agency for Marine-Earth Science and Technology  
Tokyo, Japan

*Deep Submergence Vehicle “Shinkai 6500”, owned by JAMSTEC, is the deepest manned submersible in the world. It has a depth capability of 6500 meters and was developed in 1989 by JAMSTEC and Mitsubishi Heavy Industries Ltd (MHI). The original power source of “Shinkai 6500” was oil filled pressure compensated silver oxide zinc batteries, which are very expensive and have a short life time. Moreover, operators have to be careful to keep the batteries in good condition for every dive. JAMSTEC has been developing a new type of battery since 1997, in collaboration with MHI and Japan Storage Battery Co. Ltd. In March*

2004, two sets of 108 Volt, 400 Ah lithium-ion battery packs were installed on "Shinkai 6500". This report presents the development and a comparison of the advantages of lithium-ion batteries over silver zinc.  
Email: itaru@jamstec.go.jp

**8. Operation of DSV "Shinkai 6500" after Converting Main Batteries.**

Yoshinari Ohno  
Nippon Marine Enterprises Ltd.  
Tokyo, Japan

*In March 2004, JAMSTEC replaced the main batteries of DSV "Shinkai 6500" for oil filled pressure compensated lithium-ion batteries. After replacement, "Shinkai 6500" made 59 successful dives until the end of 2004. The batteries performed perfectly as designed under all cruise conditions. There are many advantages in the operation when comparing lithium-ion to silver zinc batteries. The report presents the field advantages of the lithium-ion batteries based on the experience of operation in 2004. Since April 2004, the operation of Shinkai 6500" was entrusted from JAMSTEC to Nippon Marine Enterprises Ltd. This report will briefly describe the operational structure between the two organizations after this consignment.*

**SESSION C – Commercial Operations**  
(Wednesday Feb. 16, 8:00 – 9:30AM)

**9. Tethered and Untethered Manned Submersible Operations in the Gulf of Mexico**

Dr. Phil Nuytten  
Nuytco Research Ltd.  
North Vancouver, BC Canada

*Review of diving operations in the Gulf of Mexico after Hurricane Ivan. Discussion on the use of both types, tethered and untethered, Anthropomorphic Dive Suits (ADS) in clean-up efforts around oil platforms. Advantages and deployment logistics for both types of ADS systems will be discussed as each system was used for specific tasks.*  
Email: nrl@direct.ca

**10. Manned Submersible Research on the Cordell Banks Sanctuary**

Dan Howard  
NOAA, Cordell Banks Marine Sanctuary  
Point Reyes Station, CA USA

*Until its first exploration in 1977, the Cordell Banks were much of a mystery to fisherman for a very long time. Since then, this underwater set of islands, which lies 120 feet below the surface, has been found to nurture a very broad variety of life forms and is a center of activity for many larger species. The banks are monitored closely using manned submersibles, in an effort to better characterize this unique eco-system. The presentation will present some of the latest findings made at the Cordell Banks and highlight the work contributed by manned submersible to obtain this information. A look at future needs and wishes for monitoring the banks will also be presented.*  
Email: dan.howard@noaa.gov

**SESSION D – New Submersible Vehicles  
(Wednesday Feb. 16, 10:00 – 11:30AM)**

**11. Certification of a Submarine Design Using Fiber-Bragg Grating Sensors**

Chris Baldwin, Advanced Engineering Development  
Systems Planning and Analysis Inc  
Lanham, Maryland 20706

*Hydrostatic pressure testing of large submersible hulls in open ocean can offer cost advantages over tank tests. However, accurate strain gauge measurements is of particular concern for deep diving test. The hydrostatic testing of the submersible's main pressure hull was performed using fiber optic strain gauging technology. The presentation will present the technology and the sensors used to perform this test.*

**12. TRIUMPH – A new Three-Person Deep Submergence Submersible Design**

Ian Sheard, Charles Cousin  
Seamagine Hydrospace Corporation  
Claremont, CA USA

*The TRIUMPH submersible is the first full acrylic hull submersible designed for three occupants: a pilot plus two passengers. The vehicle was fabricated and tested during 2004 and has been tested to 1875 feet. The submersible is rated for a maximum operating depth of 1500 feet. The presentation will discuss its design features, considerations made for ABS Classing and its field testing in Southern California.  
Email: ian.sheard@seamagine.com*

**SESSION E – Manned Submersible Design  
(Wednesday Feb. 16, 1:30 – 3:00 PM)**

**13. Deep Submersible Vehicle (DSV) Design and Construction- Lessons Learned and a Path for the Future**

Charles M. Staehle (Mike)  
Submersible Systems Technology Inc. and Reef Explorer Submarines Inc.  
Riviera Beach, Florida USA

*A review and discussion of the various techniques and parameters used; what works and what does not, to design and build Manned Submersibles and especially Deep Submersible Vehicles, both military and commercial. Starting with conventional WWII military design; extending to the halcyon days for Manned Submersibles in the 1960's when the Stratton Report proposed that the United States should have an Underwater NASA and industry responded by corporately funding and building a number of manned submersibles, each unique in many ways, to get in on the ground floor of this emerging technology. The Navy extended their design knowledge with the bathyscaph TRIESTE, the DSRV's, NR-1, Deep Jeep, the development of acrylic structures and other vessels and projects some of which they extended to industry and some they did not.*

*There are many reasons that this technology and the knowledge that could have been gained about the ocean environment failed to mature. We have gained much knowledge on how to build submersibles, but the rigid conventions placed on innovation and creativity by the Navy's SubSafe program and by ASME, PVHO-1, ABS Class Rules and USCG Regulations have to a large extent stifled potential innovation and creativity. How the industry might bring back the enthusiasm, of the 60's should bring out a lively discussion and perhaps help jump start this valuable technology.  
Email: sst\_mike@bellsouth.net*

**SESSION F – Submersible Regulations**  
**(Wednesday Feb. 16, 3:30 – 5:00 PM) room 205**

**14. ABS Rules for Building and Classing Underwater Vehicles – The Process**

Ravi Tanwar  
ABS Americas  
Houston, Texas USA

*A Review of the ABS Classing process for manned submersibles. As the industry strives for innovation, efficiency and competitive advantage, it is important for industry and the regulatory agencies to have common goals and achieve a dialogue mechanism to adapt to new design conditions encountered by industry. This presentation will review the process to Class a design to ABS standards and the mechanisms in place to address industry needs.  
Email: rtanwar@eagle.org*

**15. GL Class – Experience in Classing Deep Submergence Underwater Vehicles**

Harald Pauli  
Germanischer Lloyd AG  
Hamburg, Germany

*A Review of the GL Classing process for manned submersibles. GL just finished the class review of the MIR I and II submersibles, which had the pressure hulls hydrostatically tested to a depth of 7500 meters. Discussion of the various services provided by GL and an explanation of it's basic codes and standards. Explanation of the agency's participation in IACS and internal structure should provide a better overview of the group's services, specifically related to manned submersibles. GL has over 130 years experience and is very interested in applying its expertise in manned underwater vehicles to support industry's need to class new types of submersible designs.  
Email: pau@gl-group.com*

**16. ASME-PVHO – Standards for Construction of Manned Submersibles**

George Wolf  
SouthWest Research Institute  
San Antonio, Texas USA

*A Review of the current ASME-PVHO standards and the new standard being generated with the inclusion of a section specifically for the construction of Manned Submersibles. As the industry strives for innovation, efficiency and competitive advantage, it is important to find the means for solutions to modern design problems. Although ASME PVHO does not class a design, it can become a strong steward to guide the future direction of safety in design for class agencies.  
Email: gwolfe@swri.org*

**SESSION G**

**MTS Manned Underwater Vehicle Committee Yearly Meeting**  
**(Wednesday Feb. 16, 5:00-6:00 PM) room 205**