



SESSION C2 – Manned Submersible Operations (Tuesday Feb 17, 1:30-3:00PM)

1. Field Operations of Manned Glider Submersibles

Karl Stanley
Stanley Submarines
Roatan, Honduras

This presentation details construction of a gliding submersible and the completion of over 550 dives with it; most for tourism in Roatan, Honduras, to depths exceeding 700 feet. Author will also discuss a recently completed 3,000-foot sub for less than \$120,000 by employing such techniques as developing an alternative material to syntactic foam that floats 40 percent better, yet costs less than half. Will discuss the advances in composite technology since the 1960s, when Navy-sponsored testing was already concluding subs made of such materials would have crush depths in excess of 25,000 feet.

2. Dam Inspections using Manned Submersibles and High Definition Side Scan Technology

William Kohnen, SEAmagine Hydrospace Corp.
Claremont, CA USA
Tim Beaver, Global Diving and Salvage
Seattle, WA USA

The decaying nature of underwater infrastructure is a growing national concern and the means of evaluating the net status of such assets are limited at best. The US has more than 70,000 dams, federally mandated to be inspected every five years. As diver accidents persist while performing extremely hazardous inspections and interventions, the cost of assessing problems on dams is spiraling. This paper presents a highly effective system for inspecting cracks in dams using two-person manned submersibles and high definition side scan sonar technology. The stability and maneuverability of the submersible enables very high image resolution for increased detail definition and crack identification from a safe distance.

3. Manned Submersibles in Conservation Science

Stephen Gittings
NOAA National Marine Sanctuaries
Silversprings, MD USA

National Marine Sanctuaries contain environments whose protection requires extensive characterization, monitoring, and supporting research. Visualization of habitats, living organisms, and the relationships between and among resources, including the use of manned submersibles, may be the method most commonly applied to better understand sanctuary ecosystem structure and function. Technologies required to support conservation science will be discussed, including those necessary to describe and characterize habitats, assess the distribution, abundance and diversity of living resources on the bottom and in the water column, collect samples, and deploy instruments for remote collection of data.

SESSION C2 – Manned Submersible Operations (Tuesday Feb 17, 3:30-5:00PM)

4. Sustainable Seas: the Vision, the Reality

Sylvia Earle and Liz Taylor
DOER Marine
Alameda, CA USA

This paper will review the concept behind and the lessons learned during the Sustainable Seas Expeditions (SSE), a five year study of the National Marine Sanctuaries, Mexico, and Belize, utilizing DeepWorker submersibles as the primary research tool. DOER trained over 80 scientists to pilot the submersibles, enabling them to explore areas well below safe traditional diving levels without the dangers of decompression sickness or hypothermia. The compact size and ease of handling permitted launch and recovery from a variety of vessels including two US Navy ships, one Mexican Navy ship, an Oceaneering ship, and for the first time, three NOAA ships. The project yielded new information about populations of many marine species and revealed deepwater seeps in the Gulf of Mexico.

5. Operation Coconut or the Pina Colada Wreck

James Sinclair
Nautical Archaeology
Miami, FL USA

This presentation will deal with the location, limited recoveries, and various issues surrounding a shipwreck in deepwater. During June of 2001 a small expedition was formed to investigate a suspected historic-period shipwreck in the Blake Basin in 16,000 feet of water. The site was originally found during the search for Gus Grissom's space capsule, Liberty Bell 7. The wreck site was relocated and mapped by the P.P. Shirshov Institute of the Russian Academy of Sciences using the Mir 1 and Mir 2 submersibles. High definition video cameras supplied by the Woods Hole Oceanographic Institution captured detailed images showing the effects of the harsh environment of the deep ocean. This represents the first time manned recoveries from a historic shipwreck were accomplished at this depth. The presentation shows that unique funding sources and support can be found for projects that would normally never be attempted. The participation of the private sector is crucial to these deepwater investigations.

6. Combining Manned Submersibles and Commercial Diving for Effective Subsea Intervention

William Kohnen
SEAmagine Hydrospace Corp.
Claremont, CA USA

The ability to easily and cost effectively include engineering personnel for on site inspection provides a quantum step forward to providing accurate status reports for a better prioritization of resources and asset management in an environment of severe fiscal constraints. Keeping all crew members dry and only using diver intervention for precise intervention when necessary increases safety at all levels.

SESSION E2 – Manned Submersible Design

7. Effects of the ASME PVHO-1 Standard on Manned Submersible Viewports

Dr. Jerry D. Stachiw
Stachiw Associates
Rockport, Texas USA

The conformance of viewport design in manned submersibles to the ASME PVHO-1 Safety Standard for viewports not only ensures safe performance, but also speedy acceptance by the classification societies (Lloyd's Register of Shipping, Det Norske Veritas, Germanischer Lloyd, American Bureau of Shipping, and others). Departure from the standard acrylic window configurations listed in ASME PVHO-1 is allowed, but places the full burden of proof on the adequacy of window design on the designer. This procedure is time-consuming and expensive and, therefore is usually avoided. This paper addresses the key features of the ASME PVHO-1 Safety Standard.

8. The ABCs of ABS Classing

Phil Ziegler
ABS Americas
Houston, TX USA

As the need for future manned submersibles changes from the past, large, complex deep research vessels, the industry is exploring many new concepts. Leveraging on new technology to bring less costly and more efficient manned access, it is crucial that the emerging market forces exercise wisdom in following basic self-discipline and self-regulation. The American Bureau of Shipping has classed sea going vessels for 150 years and has today one of the most comprehensive set of rules and regulations for the design and construction of manned submersibles. ABS has also been active in recognizing that the use of manned underwater vessels has changed, from where commercial machines were expected to perform 1 or 2 dives a week, to today's environment where small and large tourism vessels perform 6, 8 and 10 dives per day. From design, construction, and testing to safety standards of operation and postproduction surveying it is important that all levels of participants in the manned submersibles industry understand the basic rules. This paper presents a simple overview of the many aspects of these rules, how they are intended to be used, describing the overall process of classing a design, the various inspections required from the Engineering Group and the Field Survey Group, it's national and international authority, the meaning of IACS and the overall benefits of ABS class for international sales and owner insurability.

9. System Considerations on Manned Vehicle Design

Robert Brown
Woods Hole Oceanographic Institution
Woods Hole, MA USA

The National Deep Submergence Facility has completed the concept development for a proposed new manned deep submergence vehicle that

would replace ALVIN. The new vehicle would dive deeper, 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.

SESSION F2 – Manned Submersible Design (Wednesday Feb 18, 10:00-11:30AM)

10. Acoustic Positioning for Manned Submersibles

Marco Flagg
Desert Star Systems
Marina, CA USA

Acoustic positioning can dramatically improve the utility of a submersible, enabling it to execute tasks with precision and confidence, conduct detailed underwater surveys and document work. Yet, in ways similar to radio-based wireless technology, acoustic systems are subject to interference from man-made and natural sources as well as fluctuating propagation conditions. Successful operation in the face of these challenges requires careful system selection, integration and operation. This paper provides practical advice for the submersible designer. Case studies of submersible operations in the deep mid-Atlantic, US coastal waters, and an Austrian lake show the performance and limitations of acoustic positioning systems in the field.

11. Critical Aspects of Manned Vehicle Communication Systems

Jerry Peck
Ocean Technology Systems
Santa Ana, CA USA

When it comes to underwater communication systems, manned vehicle communications should be taken very seriously. In particular, wireless communications deserve attention from the very early stages of design. This paper is meant to alert manned vehicle designers to the importance of including communication systems in the early stages of the design. Waiting until the very end of the vehicle's construction before installing a communication system can lead to less than satisfactory results, or even failure.

12. Underwater Illumination for Manned Submersibles

Ronan Gray
DeepSea Power & Light
San Diego, CA USA

General differences between the illumination of an object in air and in the ocean are introduced. Terminology used in connection with illumination is discussed and explained with application to the ocean environment. The main types and basic description of lights used in the exploration and research of the oceans are discussed. The basics of incandescent and High Intensity Discharge Lamps are explained. Discussion of the basics of the theory and design of parabolic, elliptical and spherical reflectors and their function with respect to underwater light fixtures is discussed. Important factors in the selection of suitable lighting for underwater illumination are discussed.

SESSION I2 – Manned Submersible Operations
(Thursday Feb 19, 8:00-11:30AM)

PANEL DISCUSSION

Practical Considerations for Manned Submersible Operations

PANELISTS

- 1. Legal**
David Concannon
Law Office of D. Concannon
Wayne, PA USA
- 2. Design**
Dr. Jerry Stachiw
Stachiw Associates
Rockport, TX USA
- 3. Regulation**
Phil Ziegler
American Bureau of Shipping
Houston, TX USA
- 4. Design Safety**
Don Walsh
International Maritime Inc.
Myrtle Point, OR USA
- 5. Insurance**
John Fisk
John W. Fisk Insurance
New Orleans, LA USA
- 6. Safety of Operation**
John Pritzlaff
MTS Manned Submersibles Committee (Retired)
PA, USA

SESSION G

MTS Manned Underwater Vehicle Committee Yearly Meeting
(Thursday Feb. 19, 1:00-3:00 PM) room 204