

APPENDIX XVIII

DESSC Preliminary Response Regarding Long Range Scientific Objectives and Vehicle/Facility Requirements for Deep Submergence, and Transitioning of Sea Cliff for use by Academic Research .

- **September:** DESSC/UNOLS meeting S. Millick announces plans to retire DSV Sea Cliff and Turtle
- **October 7:** Letter from ONR (F. Saalfeld) to M. Perfit requesting DESSC input regarding utilization of the Navy deep submergence assets and preliminary assessment of deep sea scientific research objectives for the next few decades. List of 8 options.
- DESSC forms Working Group to address future directions and facility requirements for deep submergence
- **October 11:** Navy/ONR/NAVSEA reps. meet with WHOI-DSOG to discuss options provided by ONR and initial assessment of cost and effort required to transition Sea Cliff into the National Facility
- **November:** Meeting of Working Group delayed until community input can be solicited and feasibility study done by WHOI is complete.
- **December:** Initial deliberations by DESSC and preliminary response to Saalfeld.
- **December 13:** DESSC meeting. Discussion/input from community.
- **Early February:** A more formal and comprehensive assessment of these issues will be carried out by a working group comprised of experienced users of deep submergence facilities.
- Report to ONR March 1997.

SUMMARY OF MEMO TO SAALFELD/ONR

Future Directions in Deep Submergence Science

Most recent, comprehensive assessment of future deep sea research objectives for the coming decades presented *The Global Abyss* which presents a balanced, multidisciplinary view of deep sea research-present and future. Summarizes the important discoveries made by either remotely or by direct observation by manned submersibles.

Scales of investigations require a range of safe, reliable, multifaceted, high-resolution vehicles, sensors and samplers. We must find a way to provide the right complement of deep submergence vehicles and versatile support ships, and the funding to cost effectively operate those facilities.

Present Status and Future Deep Submergence Vehicle and Facility Requirements

National Deep Submergence Facilities: Woods Hole Oceanographic Institution. Alvin which can dive to a depth of 4500 m, and the remotely operated vehicle (ROV) Jason, Argo 11 imaging system, and DSL-120 sonar can work at depths as great as 6000 m.

U.S. Navy submersibles Sea Cliff and Turtle, and ROV ATV have been made available for limited academic research through a cooperative arrangement between NOAA and the U.S. Navy's Submarine Development Group I in San Diego, CA. These vehicles expanded opportunities for science and permitted observations to depths -6000 m which provides access to 37% more of the sea floor.

French, Japanese or Russian submersibles: Rather limited use and hampered by conflicting foreign national interests and differences in scheduling and funding processes.

Three critical areas which must be addressed if the U.S. is going to continue to be a leader in deep ocean research.

- a focused, cost-effective, and technically capable national deep submergence facility and operator,
- an integrated mix of vehicle systems including submersibles, ROV(s), tethered mapping systems and AUVS, and
- a stable, federal funding base to support science, technology and enabling vehicle and ship facilities in the deep ocean.

A Single National Facility

Adequate and long-term funding of a National Facility such as that currently at WHOI. Given the current federal funding constraints for both basic research and facilities support, and the level of technical knowledge and experience to operate deep diving submersibles, it would not be prudent at this time to consider developing additional National centers for operating deep submergence vehicle facilities.

Vehicle Systems

To meet present and future research and engineering objectives, particularly with a multidisciplinary approach, deep submergence science will require a mix of vehicle systems. Vehicle depth capability should be to ~6000 m to allow for research over the widest range of tectonic, sedimentologic and geographic environments that will be investigated in the decades to come.

The DESSC endorses the plan for WHOI to provide a technical assessment and costing of how to best integrate Sea Cliff into the National Deep Submergence Facility, and believes that the deep submergence technical expertise at WHOI and their operational knowledge of Navy DSV systems makes this the logical approach to evaluating the technical and cost issues.

The DESSC feels that of the options provided by ONR, combining the best attributes of Alvin and Sea Cliff to produce a cost-efficient and capable deep diving submersible with a depth range of ~6000 m. Ignoring, for the moment, the considerable technical and budgetary issues that must be addressed in accomplishing this integration, the committee notes that if such an option is considered, that it will be important for the resulting submersible to retain all of the excellent science capabilities and operational characteristics (safety, reliability, maneuverability, bottom time) which Alvin currently has.

Funding Support

Perhaps the most serious impediment to integrating Sea Cliff into the US deep submergence program is the lack of an adequate and stable funding base. The DESSC believes in order to successfully utilize and maximize the scientific assets of Sea Cliff, ONR, NSF and NOAA must work together with the community to ensure that adequate funding is provided. In this time of fiscal restraint, funding is clearly not available for an additional facility to maintain and operate Sea Cliff, nor is funding likely to increase to levels that could support science for parallel programs. Additional financial burdens on the funding agencies, without a clearly defined source of new or additional funding at this time would likely put the current successful deep submergence program at WHOI at risk.

The DESSC suggests that the federal agencies work together with the operators at WHOI and the DESSC to fully evaluate the feasibility of melding Sea Cliff and or its components into the National Deep Submergence Facility so that improved submersible facilities could be available to the science community as well as the Navy for operational and strategic needs.