

APPENDIX Ia

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

An association of institutions for the coordination and support of university oceanographic facilities.

DATE: 9 February 1995

TO: Deep Submergence Community
WHOI, National Facility Operator
DESSC/FIC KNORR Conversion Subcommittee
DESSC
FIC

FROM: Karen Von Damm, Subcommittee Chair

SUBJECT: KNORR Conversion Subcommittee Meeting of January 31, 1995

This letter is a summary, including recommendations, from the meeting held on January 31, 1995 at Woods Hole Oceanographic Institution. In 1996 KNORR is to be converted to be the deep submergence support vessel for the US deep submergence science community, coinciding with the retirement of the ATLANTIS II. The purpose of the meeting was to review the present plans for KNORR conversion, and to provide the operators with community input and recommendations regarding the conversion. A list of attendees is attached. The recommendations of the earlier meeting of this committee (September 22, 1993) were also addressed.

The major recommendations follow:

The timing of the conversion was identified as a critical issue. We most strongly recommend that the conversion and ALVIN overhaul begin early enough in CY 1996 to permit the new KNORR/DSV/ROV system to be field tested in waters close to Woods Hole and to permit field work in the North Atlantic in fall 1996, prior to the KNORR transiting to the Pacific.

It is prudent that the work be completed by late summer so that field testing need not occur at a distant site. It is also important to note that if the deep submergence science community working in the Atlantic is not accommodated during fall 1996, they are likely to face an extremely long hiatus in the availability of deep submergence assets. This will have a negative impact on the community, and may cause them to look elsewhere for facilities to accomplish their science. It was also noted that the UK is interested in purchasing US deep submergence time during this period of time for work in the central North Atlantic.

We recommend that the proposed plan to have the DSV hangar located to port be adopted. An option discussed at the meeting, for which drawings are not yet available, incorporating the DSV shops into the modified hangar structure, appears to be an even better plan. This revision to the plan will result in no loss of deck space and a smaller loss of lab space compared to the present proposed arrangement on KNORR.

The offset deck hangar appears to be most cost effective and also be most effective at retaining deck space. To preserve deck utility, at least some of the rails needed for DSV transport across the deck to the port mounted A-frame need to be removable. It is especially important that the rails closest to the stem be removable.

We recommend that the DYNACON winch be permanently installed below decks.

Without the presence of this winch, KNORR is not truly equipped to handle ROV's, and hence compromises the role of KNORR as the "deep submergence support vessel". If the winch were not permanently mounted in the hold, it would consume a large amount of deck space and would also lead to increased maintenance problems and costs. There are other traction winches in the UNOLS fleet, thus retaining the flyaway capability of the ROV system.

Due to added weight from the A-frame, additional ballast, and other proposed work, the draft of KNORR will increase by 0.5-0.8 feet. As the available models suggest, this will reduce stern slamming by 50%. We do not recommend that the rapid ballast system be installed at the present time.

If stern slamming remains a significant problem, the resulting ship shuddering may not only have a negative long term impact on KNORR, but also on the structural integrity of the DSV and ROV. If the proposed modifications do not

sufficiently dampen stem slamming, the addition of the rapid ballast system may need to be considered at a future time.

KNORR will accommodate 21 science personnel once the DSV/ROV personnel are housed. As this is a real increase of 2 bunks over the ATLANTIS II, and the cost of the least expensive berthing addition is > \$200K for 4 bunks, and this option will also result in the permanent loss of lab space, we do not recommend that more bunks be added at the present time.

While in the ideal case KNORR would carry »30 science personnel, the additional scientists will also require more lab space. If the lower lab is not converted to bunk space, KNORR retains almost twice the lab space of ATLANTIS II. The addition of 4 bunks would not obviate the need for a hotel ship for some science programs. An alternative plan provides for the addition of 12 bunks forward on the 01 level for »\$900K. Based on funding constraints it is not reasonable to propose this modification at the present time. If science program demands are shown to require significant use of hotel ships over the next few years, it may be cost effective to add those bunks at a future time.

At present KNORR is operating with two storage vans for science stowage. This is likely to continue after the conversion. As installation of the rapid ballast system is not recommended at present, there is not the associated negative impact on storage space. KNORR is presently housing full science parties for legs of 50 days with adequate dry stores, so this no longer appears to be an issue. Most submersible cruises at present are under 30 days in duration. A multi-beam system (SEABEAM 2100) has now been installed on KNORR, this previous recommendation has already been met. We recommend that the needed wet and dry ends of a combined short and long baseline navigation system be installed on KNORR as is necessary for submersible and ROV operations, and that it be integrated into a single navigation system that utilizes the high quality dynamic positioning system on KNORR. Without good navigation the utility of the deep submergence tools will be severely compromised.

To enhance the "livability" of KNORR, we recommend a space be found to house exercise equipment. While other options should be explored first, a small amount of space in one of the upper labs may, if necessary, be used for this purpose. Small boat handling on KNORR is less than ideal. We recommend that any relatively costly resolution of this be deferred unless or until small boat handling becomes a significant limiting factor in DSV/ROV launch/recovery operations.

Several ROV handling issues such as survey cable routing and slack ensioning need to be addressed during the Phase H design specifications.

The net effects of the KNORR conversion are as follows:

small net increase in science berthing for deep submergence operations compared to ATLANTIS II

- large (almost double) the available lab space on ATLANTIS II
- an effective, and integrated, vessel for deep submergence operations involving a DSV and/or a ROV
- retention of all current deck space for general oceanographic applications
- minimal negative impact on existing lab space
- minimal negative impact on existing storage space.

The net impact on the general oceanographic capabilities of KNORR as a result of this conversion are therefore minor, permitting KNORR to continue to serve in this capacity as required. The deep submergence science community is firmly behind the retirement of ATLANTIS II and the conversion of KNORR to the support vessel. While ATLANTIS II has served the community well, its limited space for science, personnel, lab and hold space has been limiting. KNORR will be a significant enhancement over those capabilities. The conversion to KNORR will allow us to truly integrate submersible and ROV operations in ways that will certainly enhance opportunities for deep submergence science, both in terms of greater capabilities as well as reduced cost. The integration of the deep submergence operations of the National Facility aboard KNORR will open new investigative horizons for the deep submergence science community in the same way the move to ATLANTIS II from LULU proved to be a significant step function in the capability of our deep submergence operations. With KNORR serving as a platform for an integrated deep submergence science program, the user community will truly have a facility that can range globally to address the challenging problems of this planet's inner space. While the conversion of KNORR is not trivial, both structurally and financially, it will serve the community well throughout the next decade of deep submergence work.

ATTENDEES

Karen Von Damm, Sub Committee Chair
Jack Bash, UNOLS
Peter Betzer, FIC

Andy Bowen, WHOI
Bob Detrick, FIC
Bob Dinsmore, WHOI
Dan Fornari, WHOI
Dudley Foster, WHOI
Jeff Fox, DESSC Chair
Rich Lutz, Rutgers
Don Moller, WHOI
Theo Moniz, WHOI
Dick Pittenger, WHOI
Barrie Walden, "WHOI

UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

An association of institutions for the coordination and support of university oceanographic facilities

Date: April 6, 1995

To: Deep Submergence Research Community

From: P.J. Fox, Chair

DEep Submergence Science Committee

Subject: Delay in Planned Conversion of R/V KNORR to Support

UNOLS Deep Submergence Vehicle Facilities

Request for Input on Areas of Interest for ALVIN diving in 1996

DESSC has been informed by NSF and ONR that the planned 1996 conversion of R/V KNORR to replace the R/V ATLANTIS II as the UNOLS deep submergence support vessel has been delayed approximately six months. KNORR was to have returned from the Indian Ocean in the Spring of 1996 to begin the conversion, and now it will likely not return to Woods Hole until early Fall, 1996. It will carry out science programs in the South and North Atlantic on its way home. This delay has come about because of ongoing deliberations amongst the agencies regarding the best course of action for the long-term health and effectiveness of the entire UNOLS fleet. DESSC and the deep submergence operator, Woods Hole Oceanographic Institution, are working closely with the agencies to ensure that a capable and long-term support vessel is available to support deep submergence science into the 21st century, and to construct a plan that minimizes disruption to the deep submergence facilities and their operations.

The present A-II/ALVIN schedule has the facility returning to Woods Hole in January of 1996. Then A-II was to leave the UNOLS fleet, and ALVIN was to commence a major overhaul of approximately six months duration. It is still too early to define a workable utilization strategy given all the unknowns, but DESSC would like to get community input on what may or may not be possible in terms of science operations. For example, although there is presently no ALVIN-related science proposed or scheduled for the first half of 1996, the A-II/ALVIN schedule could be extended into the first half of 1996 (e.g. work in the Eastern Pacific, Gulf of Mexico, MAR south of 29°N), and then return to Woods Hole. DESSC and the federal agencies realize that because of prior plans for the timing of KNORR conversion, many scientists did not request to use ALVIN in 1996. DESSC is soliciting input from the research community in the form of short letters of intent (1-2 pages maximum) stating the science programs that could be proposed and carried out in the 1996 time frame.

The lead time for preparing proposals to ONR, NOAA, and NSF is very short for new 1996 field work. Additional discussion with the agencies will be required to develop a schedule and process for consideration of potential projects. Prior to these discussions, we need to establish the scientific interests, geographical areas, potential sponsors and timeliness of requests.

In order to help us in the planning effort to respond to this change, investigators are requested to send brief letters of intent to the UNOLS office by April 21st, outlining their thoughts for ALVIN work in 1996 and proposed funding source. The issues of 1996 deep submergence field work and possible ALVIN/A-II programs past Jan. 1996 will be important agenda items for the UNOLS Council Meeting that will meet at the end of April. E-mail correspondence is encouraged for the letters of intent and the address is given below.

Any questions regarding this matter should be addressed to Mr. Jack Bash or Ms. Annette DeSilva at the UNOLS Office-URI

I thank you in advance for your collective efforts to assist us in ensuring that 1996 remains a viable year for conduct of deep submergence science with ALVIN.

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Telephone: 401-792-6825
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DESSC Memorandum to the Funding Agencies

To: Dr. R. Corell,
NSF Dr. F. Saalfeld, ONR
Dr. N. Ostenso NOAA

CC: Dr. D. Heinrichs, NSF
Dr. M. Reeves, NSF
Dr. E. Deiter, NSF
Dr. S. Ramberg, ONR
Dr. J. Andrews, ONR
Dr. H. Frey, NOAA

From: The DEep Submergence Science Committee

Date: June 2, 1995

Subject: Deep Submergence Support Ship Conversion

Gentlemen:

Based on the deliberations at our meeting this week, the committee feels strongly that the unique qualities and effectiveness of the National Deep Submergence Facility, which includes ALVIN and the ROV /towed vehicles, at Woods Hole Oceanographic Institution (WHOI) must be preserved and nurtured so that the U.S. research community continues to have access to the abyss in a safe and efficient manner into the 21st century. The continued need for deep submergence facilities is underscored by the array of fundamental scientific questions that can only be addressed by deep ocean observation, monitoring and measurement, and the advent of a variety of sea floor observatories that will monitor critical geological, chemical and biological processes on and above the deep sea floor. The DESSC believes that conversion of the new ATLANTIS (AGOR-25) represents the greatest potential benefits to the long-term support of US deep submergence science. The positive aspects of following that conversion path include greater science berthing, laboratory space, deck area, operational range, and longer projected life-span. There are some minor potential negative technical considerations which include the dynamic positioning system, and greater size and hence motion differences between the ship and submersible/ROV vehicles during launch and recovery operations. These issues are, however, being considered by several interested parties and the outlook for resolution is positive.

DESSC has reviewed the information provided by the Deep Submergence Facilities Operator (WHOI), and the reports of the Federal agencies that support deep submergence, in terms of the options that are available for providing the community with a first-class support ship that could provide service into the 21st century. The committee notes that there are two principal conversion paths. One option is that the R/V KNORR be converted. At the DESSC meeting WHOI presented a revised KNORR Conversion plan that meets the specifications of the original AGOR-25 proposal, and provides for a capable deep submergence support vessel at no cost to the Federal agencies. This proposal is well-constrained logistically and fiscally, and will result in a converted deep submergence support vessel that is ready for science operations by mid-1997.

The other conversion option includes the new ATLANTIS as indicated above. The committee favors that path, however we also note that there are important and potentially deleterious consequences to following this path depending on the schedule followed during the conversion (see Attachment Options). These consequences must be adequately addressed or the plan to use the ATLANTIS as the new support platform is unacceptable because the long-term health of the facility could be jeopardized. The most critical consequences that must be addressed with regards to

converting the ATLANTIS are:

1. the uncertainties relating to the scheduling of the conversion and the impact that has on potential stand-downs of deep submergence operations and the consequent loss of technical/operational expertise,
2. interruption of ongoing time-series deep submergence science if the conversion process extends past mid-1997,
3. integrating and contracting for the conversion effort to support deep submergence with the ongoing construction of the new ATLANTIS,
4. the costs involved in the conversion,
5. the programmatic and delivery of any WHOI supplied items that are critical to the conversion (e.g. the A-frame), and
6. certification of launch systems by NAVSEA (SEA92Q).

One result of the recent changes in plans for providing a new support ship is that the community and funding agency program managers were caught short in terms of filling-out a 1996 science schedule. In order to ensure that 1996 provides a reasonable amount of deep submergence science and facility support the committee strongly recommends that PIs who submitted deep submergence based proposals for the NSF Feb. 15, 1995 target that were declined be allowed to resubmit for the NSF Aug. 15, 1995 target. If some of those proposals are funded it would be important to permit the programs to be fielded in late 1996 and early 1997. A response to this issue is requested as soon as possible as it will clearly impact how the science community responds in the near-term to writing ALVIN/A-II and ROV proposals that could potentially be funded and scheduled for the latter part of 1996.

The committee also notes that for both conversion options a window of opportunity exists for utilization of ROV and towed vehicles through 1996 and 1997. We would encourage the agencies to look critically at science proposals that seek to use those vehicles in order to continue the process of integrating the usage of those deep submergence vehicles by the full spectrum of the deep ocean scientific community.

In order to facilitate planning with the least negative impact to the research community and the deep submergence facilities operator we request that the agencies consider the recommendations of DESSC on the

matter of the new support ship as detailed above, and arrive at a timely decision on which path is to be followed so that the community and WHOI can react accordingly and continue to be productive.

If you have any questions concerning this matter please do not hesitate to contact Mike Perfit, the new DESSC Chair, and Dick Pittenger at WHOI if there are technical questions on the facilities.

Thank you for your attention and consideration of this matter and continued support for deep submergence science and facilities.

Best Regards,

P.J. Fox (outgoing DESSC Chair)

M. Perfit (new DESSC Chair)

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