UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

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

UNOLS Office
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543

ADVISORY COUNCIL MEETING

JOINTLY WITH ALVIN REVIEW COMMITTEE

The Gunter Hotel
205 East Houston Street
San Antonio, Texas 78292

Minutes of Meeting, February 14-15, 1982

GENERAL: A joint meeting was held because the results and recommendations of various studies concerning the replacement of LULU had finally been published. It was called to order by T. Rossby, Council Vice-Chairman at 0910, February 14, 1982, in the Blue Bonnet Room, The Gunter Hotel, San Antonio, Texas. The agenda is attached as Appendix I.

The following were present February 14:

Advisory Council	ALVIN Rev. Committee
Corell, R.W.	Anderson, R.N.
Curray, J.R.	Corell, R.W.
Frankenberg, D.	Grice, G.D.
Grosline, D.S.	Rowe, G.T.
Miller, C.B.	Wimbush, M.
Rossby, H.T.	Aller, R.C. (abs)
Sackett, W.M.	Karig, D.E. "
Spencer, D.W.	Sayles, F.L. "
Van Leer, J.C.	
Robinson, B.H. (abs)	

Observers

Barbee, W.D.	La Count, R.R.
Clark, H.L.	Montgomery, A.
Dinsmore, R.P.	Stetson, T.R.
Finkle, E.E.	Wall, R.E.
Kaulum, K.W.	

1. NEW EXECUTIVE SECRETARY: Mr. William D. Barbee was introduced by T. Stetson as his replacement. Mr. Barbee will assume his new duties about March 8, 1982, at the School of Oceanography, the University of Washington, Seattle.

2. ADOPT MINUTES OF LAST MEETING: The minutes of the Advisory Council meeting of October 20, 1981, at the National Science Foundation were adopted as written.

3. SHIP NEEDS 1983: R. La Count, Head, OFS described the efforts of NSF's internal Task Group to determine the make up of the 1983 Academic Fleet. Using a base of $20.5 million for the operation of 22 of the 25 ship Academic Fleet - and a planning figure of $21.0 million in 1983 it is painfully obvious that some cuts in ship operations will have to be taken in 1983. R. Wall, Head, OSRS, described the process of developing the forecast (scientific need) for ships in 1983 and beyond. It included a survey of not only the Ocean Sciences Division, but other elements in NSF and other agency users of the fleet. A brief discussion was also held on NSF's criteria developed to evaluate which ships to retain (see Appendix II). It was pointed out that the similar criteria from the OSB draft report was integrated into the NSF criteria. R. La Count continued by identifying a few of the many problems recognized in reducing the fleet which included for example: lowering the number of ships naturally lessens the capability of the present fleet -- and soon may limit the capability to do some field programs. In 1982 some funded investigators will not get to sea and very probably it will increase in 1983.

R. La Count described the Task Group's procedures of study and said that in a meeting with ONR representatives, ONR stated that they were in agreement with NSF's procedures, and because of their vested interest in the Academic Fleet, they agreed to participate and contribute to the study. At the meeting it was agreed to discuss the Task Group's efforts with the UNOLS Advisory Council. R. La Count further pointed out that NSF would be discussing the study with the Ocean Sciences Division's Advisory Committee. The OSB report and FOFFC Task Group studies will be integrated into NSF's study when available, however, NSF must soon determine the optimum fleet mix for 1983 -- and will proceed afterward to 1984. NSF will also integrate any UNOLS advice into the study.

Later, Dirk Frankenberg summarized for the Council that the Advisory Council is in general agreement of the process of the NSF Task Group recognizing its essentially immediate needs. The Council also agrees with the forecasting procedure but has some questions on the limits of the criteria for forecasting. The criteria for ship retention in general was sound but had to be qualified because the Council had less than 24 hours to review the material provided.

4. LULU REPLACEMENT: R. Dinsmore presented the case for converting ATLANTIS II to ALVIN's support vessel by means of viewgraphs. The prospectus has been before NECOR (Northeast Consortium Research Fleet) and involves removing the top lab, building a hanger, and installing an articulated A-frame aft. See Appendix III for the presentation. At the same time ALVIN would be made suitable for single-point retrieval.

Discussion developed on ramifications of such conversion to the vessel, fleet, and scientists. It was noted LULU was often escorted which resulted in added costs, but it will still be necessary to acoustically monitor ALVIN while diving. An "escort" buoy might be developed to satisfy this requirement so ATLANTIS II can engage in other work while acting as the support vessel.

The Advisory Council and ALVIN Review Committee passed the following resolution; as there were no abstentions it passed unanimously.

RESOLUTION Recognizing the need for an immediate replacement of R/V LULU as the support vessel for ALVIN, as set forth in the Submersible Science Study of February 1982, it is the recommendation of the UNOLS Advisory Council and the ALVIN Review Committee that:

1. Woods Hole Oceanographic Institution prepare a fully documented proposal for the conversion of ATLANTIS II for ALVIN support

2. As a second phase, that a proposal be prepared for conversion of KNORR and/or MELVILLE

3. The ATLANTIS II conversion proposal should be completed by April 15, 1982, anticipating ATLANTIS II/ALVIN operations would commence in 1983

4. Simultaneous review of the ATLANTIS II conversion should be accomplished by Federal funding agencies within the ALVIN Interagency Agreement, with the goal of committing the necessary funds to achieve the above schedule

5. The ALVIN Review Committee will continue to review the submersible science program and make further recommendations for both near and far term utilization

5. NEW TECHNOLOGY PROGRAM: L. Clark, Program Manager for Oceanographic Technology OFS/NSF, introduced a statement of what his office would welcome in the way of proposals for shared-use instrumentation including the development of same which is new. For a more complete statement of the announcement see Appendix IV.

6. SET MEETING DATES: Those present agreed the following dates could be set:

1 April, UNOLS Nominating Committee prepares slate

22-23 April 1982, ALVIN Review Committee, W.H.O.I.

23 May, Joint Meeting of East & West coast scheduling groups

23 May, Advisory Council meeting, D.C.

24-25 May, UNOLS Semiannual Meeting, D.C.

13 October, Advisory Council

14-15 October, UNOLS Semiannual Meeting

7. COUNCIL STANDING ROLES: PROGRESS REPORTS: Reports were taken in the order listed in the agenda. See Appendix I, item 7.

a. J. Curray had summarized cruise assessment forms forwarded from the UNOLS office. Problems, when there were any, could be broadly divided into two categories: those experienced by a vessel's institutional users and those encountered by extra-institutional personnel. It was not evident the latter were caused solely by lack of communication.

Many were incompletely filled out; he thought the form might be organized in such a way that it would encourage completion. For a draft of the evolving form see Appendix V. Summarized edited data will become a part of the Council's annual report on this standing assignment.

The Council agreed to a plan to distribute summaries quarterly to operating institutions and major funding agencies. A more efficient method of administrating these forms would be to have the operators ensure their vessel's clients completed the forms upon departure from the vessel. They would then be collected by the UNOLS office for further use.

MOTION: The Council voted to adopt and employ the revised form immediately.

b. D. Frankenberg had requested and received vessel user manuals from 12 of 17 operating institutions. His summary is attached here as Appendix VI, with additional comments (f-h) from this session.

The Council will work towards a more uniform and comprehensive content for these manuals and insist updated manuals be provided the UNOLS office.

It was voted to:
Adopt the ideas set forth in his summary and send operators for comment.

c. T. Rossby was able to distribute the Preliminary Report of Winch & Wire Sub-committee by A. Driscoll, URI, which had been under preparation by the former Technology Assessment Committee. It is too long to include here, but is available from the UNOLS office.

Recognizing upgrading fleet winches and wire cannot be accomplished without major costs, nevertheless the Council realized it is an important goal.

A summary of wire recommendations follows:

1) Trawl: 9/16" & 1/2" 3 x 19 wire rope, torque balanced
2) Hydro: 1/4" 3 x 19, torque balanced
3) Acoustic: .303" double armor, 3 conductor

plus, briefly, general points:

1) fleet wide upgrading of sheaves and their bearings
2) adequate winch/wire logs and preventive maintenance such as lubrication, retirement plan, etc.
3) Installation on winches of grooved shells
4) establishment of fleet wire rope & EM cable inventory
5) establishment of wire safety levels
6) provision of accurate tension monitoring
7) bulk wire purchase

Because of the nature of specific recommendations it was recognized the report must go to operators for comment prior to May's semiannual meeting.

The Winch/Wire Report ! Has it been distributed?

d. D. Spencer proposed a computer workshop or other forum which would consider their application, technology and engineering and focus on special problems of oceanography. In the ensuing discussion it appeared that industry, the Navy, astronomers, as well as other entities could make contributions.

As a beginner Drs. Corell, Rossby, and Spencer would develop a prospectus for the project and this would be circulated to the other Council members for comment.

e. W. Sackett had attended the East Coast Regional Scheduling Group meeting 10 February in D.C. as representative of Associate members. He was impressed by its effectiveness but recognized there was a lot of work to do in view of the major concerns facing UNOLS.

f. B. Robinson, representing West Coast Associate members was absent and will be unable to attend the West Coast scheduling meeting being at sea.

g. J. Van Leer read a memo from Dr. Otis Brown, RSMAS, who has for some time been involved with the UNOLS satellite communications link (SCL) which U. of Miami operates on behalf of the community. He suggests establishment of a UNOLS frequency coordinator which could then develop links with various funding agencies. His additional effort on behalf of the SCL is not warranted and continued justification resides in the scientific community.

Agency representatives present expressed the wish for documentation of degrees of use tied to actual grants. It was difficult to see who could put together such a profile. D. Spencer suggested letters of endorsement from user institutions be solicited and compiled to document its value. He agreed to initiate same.

h. C. Miller's memo on ship design emphasizes UNOLS must prepare for vessel replacement immediately if there is not to be a serious gap by the year 2000. The Council generally backed his statement and in particular focussed on a high latitude R/V. The following resolutions were passed:

The UNOLS Advisory Council recommends that UNOLS immediately organize an effort to conduct a design study for new oceanographic ships. This should focus on replacements for ships equivalent to the 190-220 ft. class such as THOMPSON, CONRAD, WASHINGTON, ATLANTIS II. Replacements need not be classical ships, but should provide at least the basic capabilities of 200 ft. ships.

The UNOLS Advisory Council recommends that UNOLS encourage Federal support for construction of a polar research vessel so that the USA can maintain a capability for internationally competitive research on the strategically important and resource-rich high-latitude areas of the world ocean.

i. R. Corell had no report on ship management; he had devoted considerable time to the Submersible Science Study report as well as LULU replacement affairs.

j. T. Rossby had no report on special facilities.

k. D. Gorsline suggested bulk purchases could be divided into two major categories: one time purchase of capital items such as winches and expendible supplies such as wire. He doubted items as fuel and food could be handled in bulk mode. R. Corell questioned whether fuel couldn't be purchased in bulk; it would involve getting all members together, dealing with one supplier, and represent an additional paperwork effort.

A major incentive for UNOLS to reduce the number of oceanographic wire in use is the indication that ONR would be willing to replace winches if the fleet can standardize on wires.

J. Van Leer suggested pingers that could be fixed to a vessel, reminiscent of flight recorders, could save much time in case of accidental sinking might be an item of bulk purchase. T. Stetson suggested that since many of the deep water institutions have US funds locked in foreign ports by their agents that another institution's vessel might tap those funds when in port. Reimbursement could be worked out later.

The UNOLS office is available to arrange bulk purchases.

8. NASULGC: D. Frankenberg described the National Association of State Universities & Land Grant Colleges' activities. This organization reports events on the national scene to its members.

The Council went into executive session for an hour for further discussion.

9. OSB REPORT: A summary of recommendations in the Ocean Sciences Board report "Academic Research Vessels 1985-1990" were reviewed and discussed.

10. OTHER:

a. Restriction of Scientific & Technical Data: R. Corell was concerned with a presidential Executive Order intended to regulate the flow of such. The Council was referred to the 3 July 1978 Federal Register part IV for a National Security Information Proclaimation. He was asked to signal his concern to members on the electronic mail service if he thought UNOLS should take a stand.

b. Electronic Mail Service: D. Spencer was disappointed at the usage and was keeping statistics on it. A year's experience will have been had by the May meeting at which time it can be evaluated.

c. User Fees: R. Corell was concerned about the impact of user fees if assessed by Federal agencies on the research dollar. All agreed the situation bears watching.

Adjourned 1345
15 February 1982

Thomas Stetson
Executive Secretary
UNOLS

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ADVISORY COUNCIL MEETING

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0900, February 14-15, 1982
The Gunter Hotel
205 East Houston Street
San Antonio, TX 78292

AGENDA

Introduce Mr. William D. Barbee, Executive Secretary, UNOLS

Adopt Minutes of Meeting October 20, 1981

Ship Needs 1983, Ron R. La Count, Head, OFS/NSF

LULU Replacement, Discussion & Recommendations

New Technology Program, Larry Clark, Program Manager, OFS/NSF

Set Dates of Next Advisory Council & Semiannual UNOLS Meetings

Standing Roles of the Advisory Council: Progress Reports by

a.) J. Curray, Fleet Efficiency & Effectiveness
b.) D. Fankenberg, R/V User Manuals
c.) T. Rossby, Winches & Wire
d.) D. Spencer, Computers
e.) W. Sackett, East Coast
f.) B. Robison, West Coast
g.) J. Van Leer, Communications
h.) C. Miller, Ship Design
i.) R. Corell, Ship Management
j.) T. Rossby, Special Facilities
k.) D. Gorsline, Bulk Purchases

National Association of State Universities & Land Grand Grant Colleges (NASULGC)
Discussion lead by D. Frankenberg

"Academic Research Vessels 1985-1990"
OSB's Report will be discussed if available

Other

Criteria for Assessing Ship Retention Value

Recent and projected use of the academic fleet provides a general picture of the scientific needs for shiptime in the various size classes. These needs are substantially limited by available research funding and are exceeded by available shiptime in several of the size classes. And, it appears that this situation will continue for the next several years at least. Under these circumstances and in order to get the most out of limited resources, we believe it desirable to diminish the size of the fleet and concentrate our resources on a smaller number of ships. Clearly such action will impact the field of ocean science. It must therefore be done cautiously, objectively, and with the view of minimizing the difficulties and maximizing the benefits. It must also begin immediately in order to deal effectively with the short-term problems we face in FY 1983 and it should lead to a continuing, long-term evaluation of the composition and usefulness of the academic fleet ships.

As a guide for making these short- and long-term assessments of the academic fleet, we have developed a set of six criteria. These criteria when applied to individual ships will provide a measure of the scientific value and operational effectiveness of that ship relative to other ships in her class size. The criteria are weighted differently, are non-overlapping to the extent possible, and allow for gradations among the ships in a given class.

The criteria are listed in Table 1 and the numbers below correspond to that table. The six criteria fall into three categories. The first category relates to the ship itself, and includes an assessment of i) the scientific capability of the ship, and vi) the present material condition of the ship. The second category involves the operation and use of the ship; this includes an assessment of v) the quality of recent operation and ii) the value to the Foundation and ONR of her recent scientific use. The final category attempts to assess the importance of a ship on iv) a regional and national basis and iii) an institutional basis.

These criteria and some general assessments of their weighting are discussed in more detail below.

(i) Scientific Capability

The following factors, and their rationale, warrant consideration in assessing the ability of a ship in a given class to carry out scientific programs.

a) The size, arrangement, and equipment available in the wet and

dry laboratories. The quality and extent of work that can be carried out on board a ship is also dependent upon configuration and space available in her laboratories including portable vans. Are fresh and salt water available? Regulated power at convienent outlets? Freezers and fumes? Is the wet lab convienent to the chains? Can many bottles be accomodated? Are the labs laid out so that people aren't always tripping over one another?

b) The number of scientists that can be carried, the quality of their accomodations, including messing arrangements. Because of the complexity of the marine environment, it is often necessary to have a number of specialists aboard and for them to be able to work around the clock and at all times of the day; observations in remote locations are also necessary, and this, and other considerations, may require extended cruises; hence, it is important that a reasonably sized scientific party be carried, and for their morale and the quality of their scientific work to remain high, it is necessary that they be accomodated with reasonable comfort on board the ship.

c) The amount of deck and hold space suitable for storage, the amount of deck space assessable by winch or crane and suitable for use with over-the-side operations. Multi-legged expeditions often require that specialized equipment be stored, especially when different disciplines are using the ship, and in carrying out over-the-side operations, it is important that space be available on the deck to lay out equipment, and if necessary, to pick up and move around heavy items of hardware.

d) The manuverability of the ship, her sea keeping ability, and her comfort in a sea way. These are important consideration in carrying out scientific operations, especially in moderate and rough weather (when it is also important to make in situ observations); the ride of the ship often affects the scientists' ability to do precise laboratory work; manuverability is important in keeping wire angles at acceptable levels, in picking up floating equipment, and in setting moored arrays.

e) Configured for important scientific instrumentation and experiments. In this category we include additional and specialized observational capability such as sea beam, ice-strengthened hull, acoustic doppler profilers, cold rooms, lack of C14 contamination, acoustic quietness, and multi-channel seismic capability.

f) The ability of the ship to handle equipment, e.g. her outfit and placement of winches, capstans, A-frames, booms, and cranes. Most experimental work depends on handling equipment over the side such as nets, corers, CTD and Rosette samplers, sediment traps, underwater electronic equipment, buoys and current meter moorings, etc.

g) The speed of the ship. This is an important factor in minimizing the time between stations, the time to an operating

area, and determines the "synopticity" of a survey.

h) The endurance of the ship. This determines the number of days a ship can operate at sea and the total distance that she can travel; it is an important scientific consideration when observations must be made in remote locations or for an extended period of time, and also when an extended cruise track is necessary such as the Scorpio sections across the South Pacific.

i) Multipurpose capability. In general, it is important that a ship be able to handle a wide range of projects, not only to insure that the demands of a multi-disciplinary cruise be meant, but also so that when a ship is operating in a given region, she can be assigned a variety of tasks.

In general we feel that scientific capability is the single most important criterion in assessing the value of a ship. This is based primarily on the fact that many of the factors included with in this criterion, such as speed and endurance and seakeeping, are difficult or costly to change.

(ii) Value to NSF/ONR of Recent Scientific Use

This criterion is meant to assess the extent to which the ship has proven in recent years to be an important and widely used platform by NSF and ONR sponsored researchers. These projects comprise the bulk of academic basic research, and, as with basic research itself, continuity of effort is important for effective ship operations. Elements of this criteria are:

a) actual use by NSF/ONR projects;

b) actual use by OCE projects.

This criterion merits a moderately heavy weight as a good measure of satisfactory operation, utility, availability and demand.

(iii) Institutional Importance

The existence of an institutional ship is often an important factor in recruiting faculty and developing research and educational programs. In applying this criterion, the following elements warrant consideration:

a) the scientific capability and potential of an institution;

b) the institutional (vs. outside) use of the vessel;

c) the impact on the institution if the vessel were lost; and

d) available or negociable alternatives to meeting the institutional needs for shiptime.

The weighting of this criteria is most difficult to assign. In some instances it could be the overriding consideration at least in the short-term. Over time, as shared use and regional or joint scheduling increase, it may become less important.

(iv) Regional and National Importance

Because of a specific scientific capability, or because they are the only vessel which operates regularily in a region, some ships may have an importance than transcends their institutional affiliation. To aid in this assessment, the following elements should be considered:

a) the availability of suitable alternate ship(s) in the region;

b) the extent to which the scheduling procedure for the ship is regionalized;

c) the quality of the regional scientific programs using the ship;

d) the fullness of the ships schedule in supporting regional needs; and

e) the importance or uniqueness of the geographic area.

We believe this criterion warrants moderate weight, but its importance is somewhat lessened by the mobility and range of ships.

(v) Quality of Recent Operation

This criterion is meant to assess the quality of the operation of the ship by her crew and institution. Elements to be considered include:

a) the capability of the captain and crew to perform their duties and includes navigation, piloting, seamanship, vessel manuvering, operation of her engines, propulsion, generators, pumps, and other engine room and deck machinery;

b) the cooperation of the crew with the embarked scientific party;

c) the institutional support and management of the ship operation;

d) the total days the ship is operated at sea; and

e) the daily operating costs and cost effectiveness.

This is a more important criterion than is probably generally recognized and warrants a moderate weight. Many scientists would willingly sacrifice some ship capability in order to work with a professional, helpful crew. Overall fleet efficiency will be improved if, compared to other ship's in her class, a vessel is able to get more work done per day at sea or spend an additional month or month and a half at sea per year. However, to some extent, these factors can be managed and tend to change over time. Reassignment of a ship to an institution with a better marine operations department is also a method to resolve problems in this category.

(vi) Present Material Condition

This criterion is meant to assess the state of maintenance and the condition of a ship. Elements warranting consideration include the condition and general maintenance of the:

a) hull,

b) engines and propulsion system,

c) winches and deck machinery, and

d) interior spaces including habitability.

Also included are the ship's:

a) estimated remaining life, and

b) her required upgrading and refit costs.

In managing a stable fleet which met all scientific needs, this criterion would provide an important guide for planning vessel replacement and maintenance. In assessing retention value of ships in a given class size of the fleet, it warrants sufficient weight so that all else being equal, it would clearly discriminate between two individual ships, one in good condition and one in poor condition.

TABLE 1

Criteria For Assessing Ship Retention Value

I. Scientific Capability

- Factors to be considered include:

  * Laboratory Availability/Capability
  * Size of Scientific Party
  * Usable Deck Space and Hold Space
  * Maneuverability/Seakeeping/Riding
  * Configured for Specialized Instrumentation/Experiments
  * Equipment Handling
  * Speed
  * Endurance
  * Multipurpose Scientific Capability

II. Assessment of Value to NSF & ONR of Ship's Recent Scientific Use

- Factors to be considered include:

  * Actual Use by NSF & ONR Grantees
  * Actual Use by OCE Grantees

III. Institutional Importance of Ship

- Factors to be considered include:

  * Scientific Capability/Potential of Institution
  * Institutional (vs. Outside) Use of Vessel
  * Impact on Institution if Ship Lost

IV. Regional/National Importance of Ship

- Factors to be considered include:

  * Availability of Alternate Ship(s)
  * Quality of Regional Science Program Using Ship
  * Openness of Scheduling Procedure for Ship
  * Ship Supports Research in Unique/Important Geographic Areas
  * Fullness of Recent Schedules

V. Assessment of Quality of Recent Operation

- Factors to be considered include:

  * Capability and Cooperation of Captain and Crew
  * Operation of Ship's Equipment (winches, wire, etc.)
  * Operation of Ship (Engines, Propulsion, etc.)
  * Institutional Management of Ship Operation
  * Tightness/Efficiency of Scheduling
  * Operation Costs

VI. Present Material Condition

- Factors to be considered include:

  * Estimated Life
  * Required Upgrading/Refit Costs
  * Engines/Propulsion
  * Hull
  * Winches/Equipment Handling
  * Habitability
  * General Maintenance

APPENDIX III

WOODS HOLE OCEANOGRAPHIC INSTITUTION
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TWX 710-346-6601

9 December 1981

MEMORANDUM TO DISTRIBUTION

SUBJECT: R/V ATLANTIS II FOR ALVIN SUPPORT

In the Engineering Study of UNOLS SHIPS AS A SCIENCE SUBMERSIBLE SUPPORT SHIP, John W. Gilbert Associates has done an excellent job of examining the ships against criteria set forth by the UNOLS Submersible Science Study Group. I have examined this report carefully and generally agree with the conclusions. I would submit, however, that the feasibility of R/V ATLANTIS II has not been fully considered.

Page 5 states that ATLANTIS II does not have sufficient vertical moment. Page 3W corroborates this showing an available scientific payload of 2,583 foot-tons against a requirement of 2,718 foot-tons for ALVIN and its outfit. In this comparison the Report is correct. However, additional payload can be generated by removing the upper laboratory deckhouse. This lab which gets little effective use represents about ten tons, fifty feet above the base line and thus would generate about 500 foot-tons of additional available vertical moment. This would meet the ALVIN requirements and provide a surplus of 365 foot-tons. Additional calculations involving carrying part of the ALVIN outfit below decks in the generous space available on ATLANTIS II would reveal an even greater availability.

The Report further places an additional restriction on the basis of a 40-foot after deck length. The actual center line measurement is closer to 54 feet, and even with the addition of a hanger as shown on the attached figure, a clear deck length of 46 feet is available. I would argue that this is not limiting but might even be desirable (refer to plans and pictures of existing support ships in the Report).

In other respects ATLANTIS II has a great deal to offer. Points to be made include:

- ATLANTIS II has the size and endurance intended to accomplish the future programs LULU is not now suited for.
- Installation would be simpler and probably less costly than on any other UNOLS vessel.
- ATLANTIS II was designed for (and can) berth fifty-five persons. For extended cruising fifty persons is a more comfortable number. Overall habitability is excellent.
- By converting the after portion of the main laboratory, a submersible hangar is a feasible installation.
- Even with a hangar installed and the upper lab removed, ATLANTIS II has more laboratory space than any other UNOLS ship.
- The installation would not impair the multi-purpose science capability of the ship. In fact, with the submarine secured in the hangar the ATLANTIS II could revert to almost any scientific discipline.
- ATLANTIS II has good fuel economy. At 12 knots cruising the ship consumes less fuel than KNORR which cruises at 10½ knots.

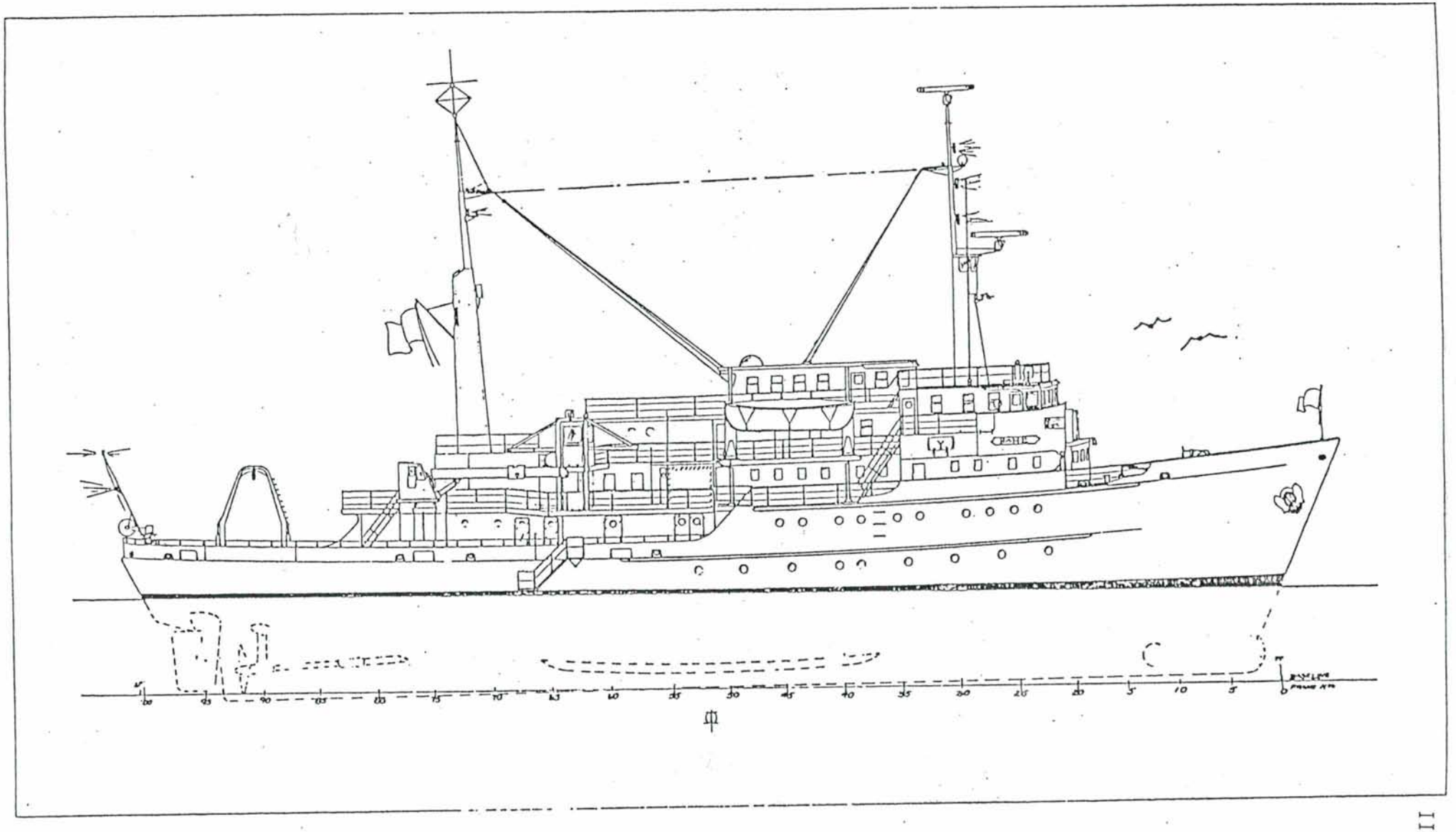
The present configuration of ATLANTIS II is shown on Figure 1. Figure 2 shows a configuration to carry ALVIN (or a 6,000 meter sub). Here the stack has been moved forward and a hangar installed. Figure 3 is the accompanying inboard profile.

It is recommended that serious consideration be given to the potential of ATLANTIS II for ALVIN support. The Woods Hole Oceanographic Institution would be willing to undertake a detailed engineering study and cost analysis for this purpose.

R. P. Dinsmore

Distribution:

UNOLS Office, R. Corell, E. Allmendinger, R. La Count, K. Kaulum, J. Gilbert



Present Configuration

R/V ATLANTIS II

Figure 1

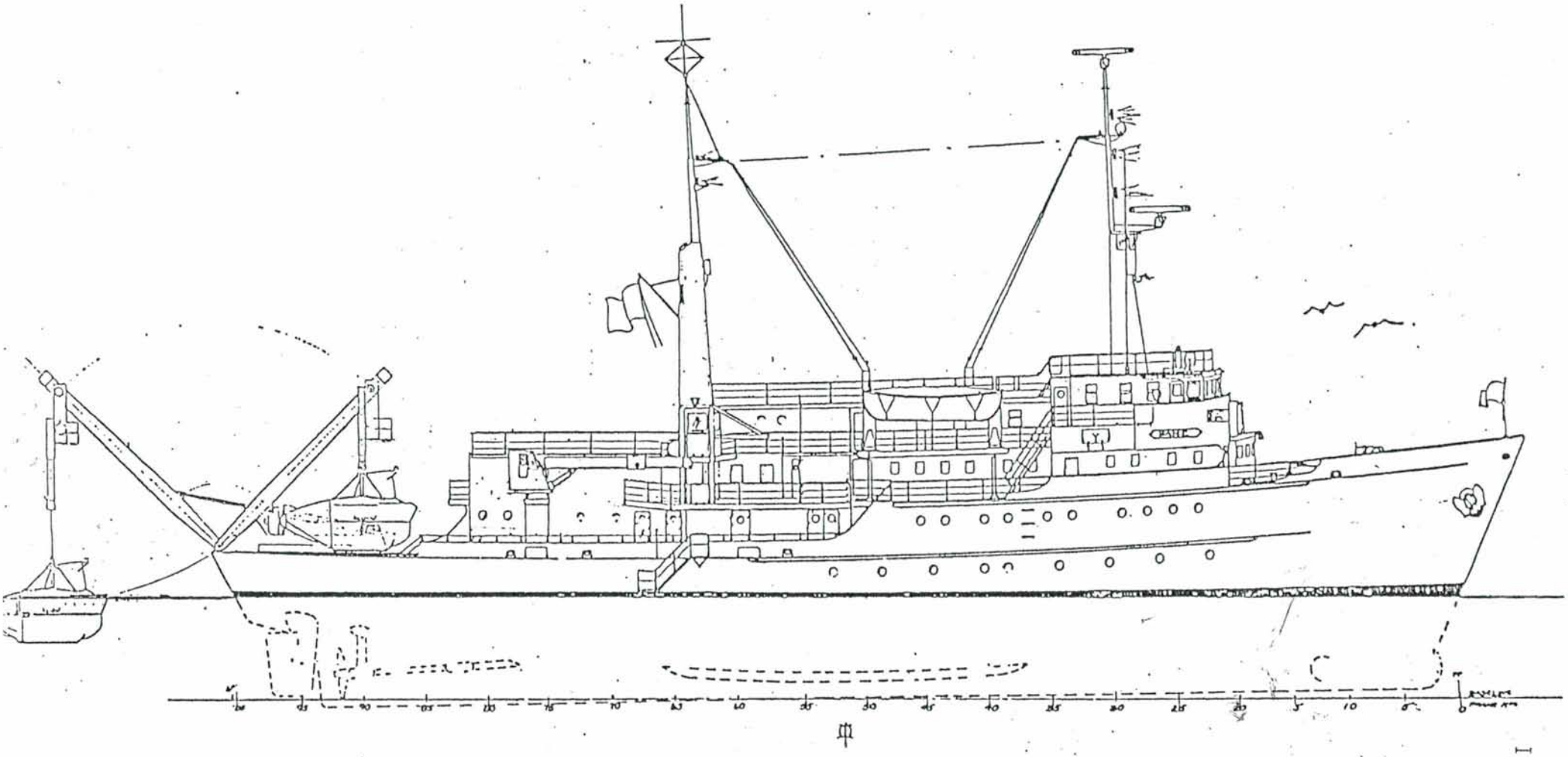
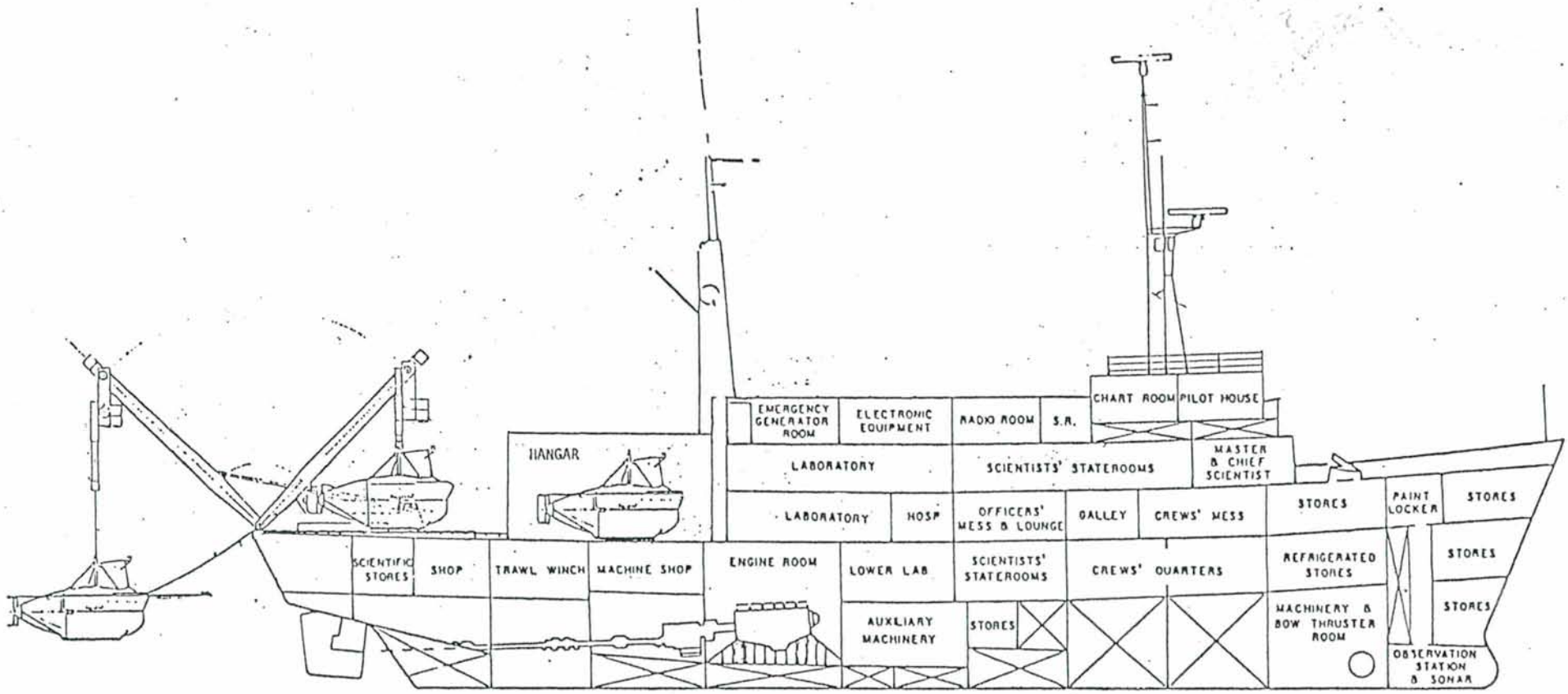


Figure 2

R/V ATLANTIS II Configured as ALVIN Support Vessel



R/V ATLANTIS II

Inboard Profile showing Re-arrangement with Submersible Hangar

Figure 3

SUBJECT: R/V KNORR FOR ALVIN SUPPORT

Much of what has been said regarding R/V ATLANTIS II is true of R/V KNORR.

No special stability problems exist except the added weight would submerge the current load line more on a technicality than a real problem. By some minor modifications and administrative negotiations with ABS and USCG this is feasible to overcome.

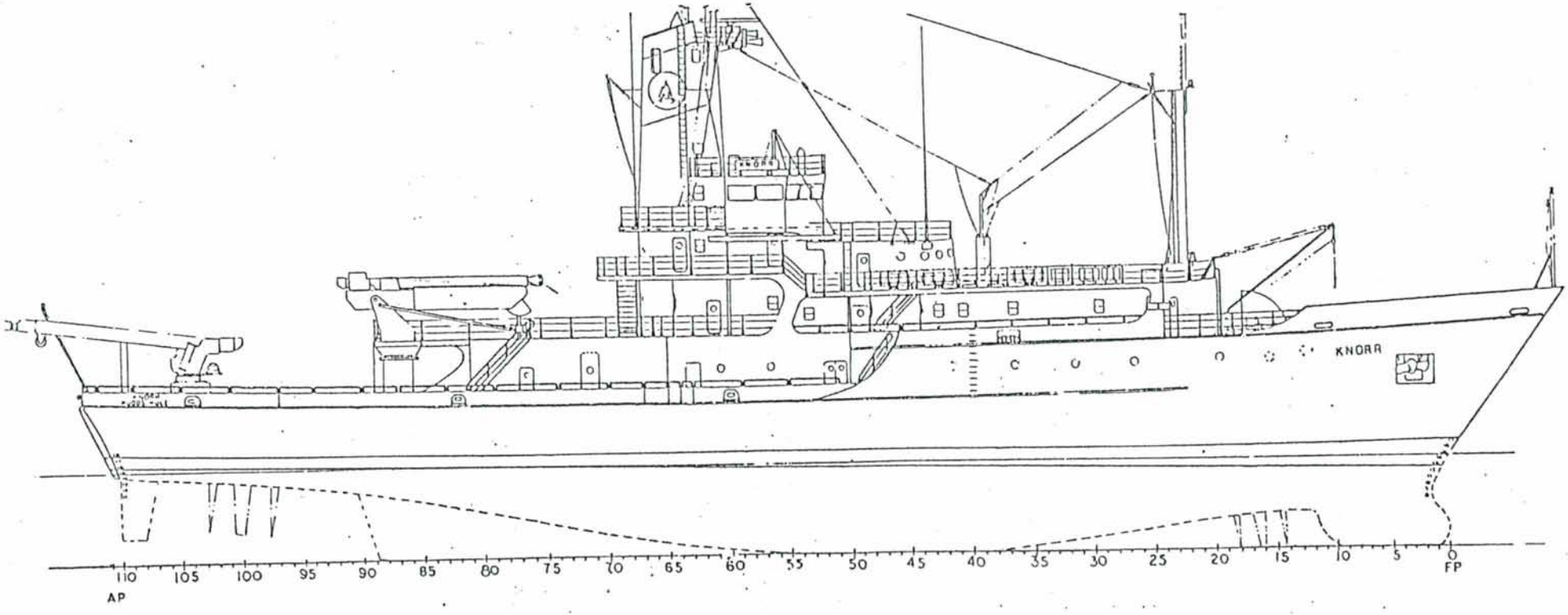
Afterdeck on KNORR is especially commodious but hangar arrangement is less adaptable with exising deckhouses. Further, because KNORR has less scientific lab space than ATLANTIS II, care will be required not to encroach upon it. This may require ALVIN van use which is not required on ATLANTIS II. KNORR afterdeck is about two feet higher from water than ATLANTIS II.

Some strengthening of hull girder aft of frame 90 may be required probably through the use of center line bulkheads.

KNORR cruising speed is 10 1/2 knots vice 12 knots for ATLANTIS II and holds accommodations for four fewer scientific and technical personnel.

Probably the most desirable arrangement is to have both ships adapted for ALVIN support so that flexibility in choosing ship capability to be compatible with the accompanying scientific requirements of a particular cruise.

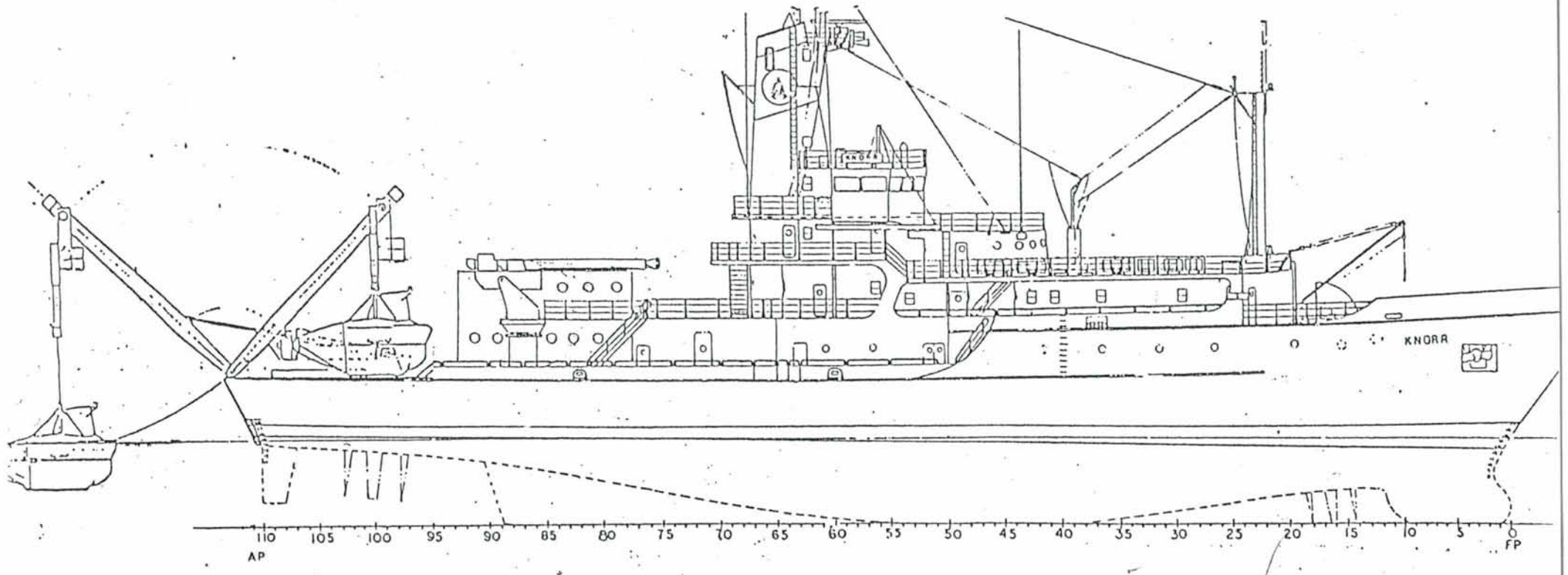
Figures 4 - 6 show an example of KNORR configuration.



R/V KNORR

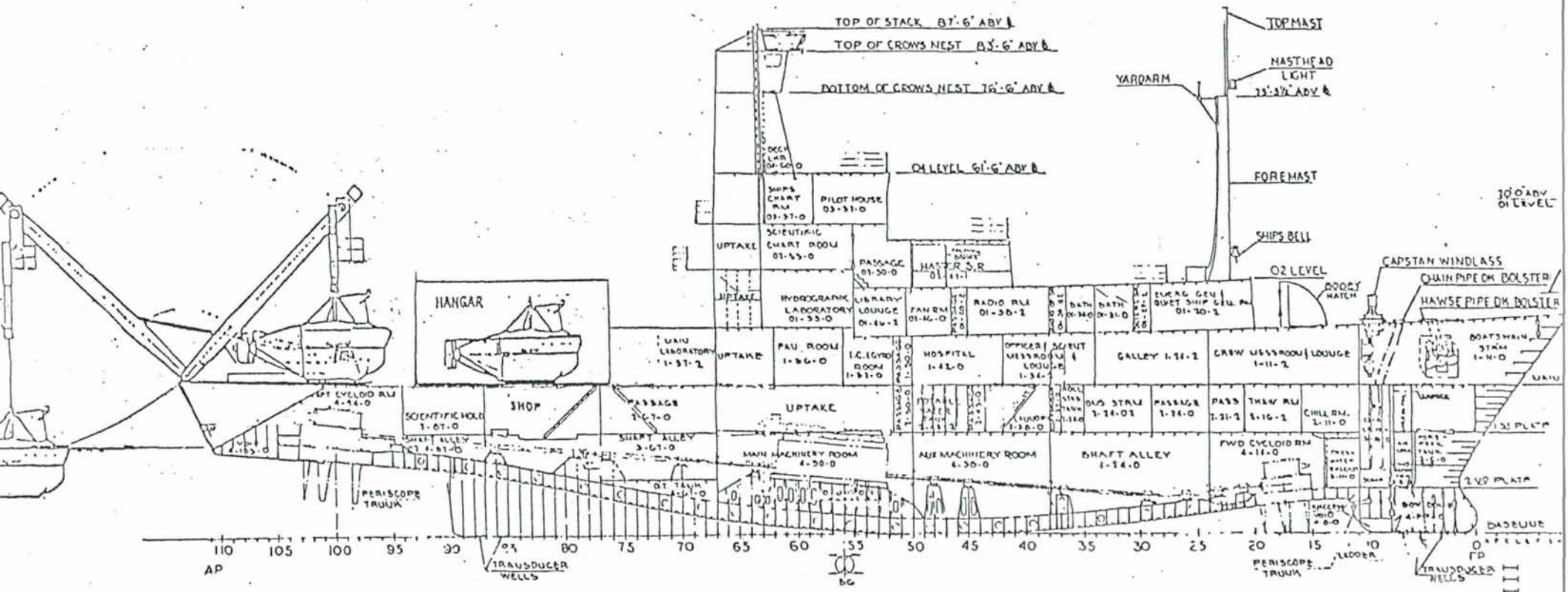
Present Configuration

Figure 4



R/V KNORR Configured as ALVIN Support Vessel

Figure 5



R/V KNORR

Inboard Profile showing Re-arrangement with Submersible Hangar

Figure 6

NOTES ON USE OF R/V ATLANTIS II or R/V KNORR FOR ALVIN SUPPORT VESSEL

1. Based on current three-year data LULU operating days average 235. Assuming a transit speed of about 2x, the equivalent AII/KNORR operating year for ALVIN support would be about 206 days. This would permit about 60 days for other scientific cruising.

2. An average of 131 operating days per year have gone into additional support vessels. The assignment of AII/KNORR to ALVIN support for equivalent operations would:

   - Eliminate LULU from the system
   - Reduce total fleet "capacity" by 206 annual operating days
   - Add back 131
   - Net reduction of fleet capacity of 75 annual operating days

3. This means that for the savings in retiring LULU (about $1M) a net loss to the system of only 75 ship days results. The total annual cost of ALVIN operations would remain about the same although the distribution between individual cruises would change. Small coastal projects not now requiring an escort would cost more, and projects now using additional support vessels would be less expensive. If costs are about the same, the overall savings are represented by the elimination of LULU (about $1.0M/year).

4. Installation of an ALVIN capability on either ATLANTIS and/or KNORR involves the following:

   a). Procurement of stern mounted, single point lift, inverted "A"-Frame similar to that described in the Gilbert report. This is estimated at $800K plus installation costs.

   b). Design and installation of suitable deck fittings and tracks. A suitable hatch between tracks is needed for submarine battery removal.

   c). Fabrication of suitable permanent or portable hangar. A permanent hangar not derogating the remaining capability might be a desirable feature. This appears easier to accomplish on ATLANTIS II than on KNORR. Both are feasible.

NOTES (AII/KNORR for ALVIN SUPPORT VESSEL) Cont.

d). Some deckhouse and interior rearrangements to provide for submersible operations and maintenance. Again, more easily accomplished on AII than KNORR where vans might be more suitable.

e). Stability study and modifications to meet any requirements noted. This includes removals and/or ballast and administrative arrangements with ABS and USCG.

f). Hull strengthening where required, probably limited to possible centerline bulkhead KNORR aft.

g). Installation of underwater acoustic tracking system.

h). In case of ATLANTIS II, possible replacement of bow thruster.

Preliminary costs are somewhat higher than shown by Gilbert study, chiefly because of (d)-(h) above which were not included in the Gilbert report. These are summarized on the attached sheet:

ATLANTIS II	-	$1,440,000
KNORR	-	$1,425,000

R.P.Dins
13 Jan.1982

COMPARISON OF ACTUAL COSTS OF ALVIN OPERATIONS TO THEORETICAL COSTS USING ATLANTIS II OR KNORR FOR SUPPORT VESSEL

	ACTUAL COSTS	1980	1981	1982	3-YR AVERAGE
1	ALVIN Cost	$ 881,100	$ 999,000	$1,246,500	$1,042,200
2	LULU Cost	912,500	1,060,000	1,158,800	1,043,766
3	Total ALVIN/LULU Cost	1,793,600	2,059,000	2,405,300	2,085,966
4	Support Ships: Days	101 days	151 days	143 days	132 days
5	Support Ships: Costs	644,711	1,068,436	1,313,700	1,008,949
6	TOTAL COSTS	$2,438,311	$3,127,436	$3,719,000	$3,094,915
	CONSTRUCTED COSTS				
7	LULU Operating Days	223 days	203 days	279 days	235 days
8	Includes LULU Transit Days	68 days	45 days	64 days	59 days
9	Equivalent ATLANTIS II Transit days (½)	34 days	22 days	32 days	29 days
10	Equivalent ATLANTIS II Operating Days	189 days	181 days	247 days	206 days
11	ATLANTIS II/KNORR Daily Rate	$ 7,500	$ 10,500	$ 10,600	$ 9,533
12	Equivalent AII/KNORR Cost (D/R x Op.days)	$1,417,500	$1,900,500	$2,618,200	$1,978,733
13	ALVIN COST	881,100	999,000	1,246,500	1,042,200
14	TOTAL COST: ALVIN/ ATLANTIS II (KNORR)	$2,298,600	$2,899,500	$3,864,700	$3,020,933

ALVIN/LULU OPERATIONS ESCORT AND SUPPORT SHIP COSTS 1980 - 1982

1980

CONRAD	23 days @	$ 5,095 =	$ 117,185	NOAA
KNORR	63 days @	7,572 =	477,036	NSF & ONR
EASTWARD	15 days @	3,366 =	50,490	USGS
TOTAL	101 days		$ 644,711	

1981

EASTWARD	47 days @	$ 4,542 =	$ 213,474	NOAA
MELVILLE	72 days @	10,439 =	751,608	NSF & ONR
E. B. SCRIPPS	32 days @	3,229 =	103,328	NSF
TOTAL	151 days		$1,068,410	

1982 (Scheduled)

E. B. SCRIPPS	25 days @	$ 3,600 =	$ 90,000	NSF
NEW HORIZON	53 days @	7,400 =	392,200	ONR & NSF
MELVILLE	37 days @	11,500 =	425,500	NSF
RESEARCHER	28 days @	14,500 =	406,000	NOAA
TOTAL	143 days		$1,313,700	

SUMMARY OF ESTIMATED COSTS

FOR SUBMERSIBLE HANDLING

R/V ATLANTIS II

Removals	$ 10,000
Tracks and Hatch	20,000
Stack and vent relocation	35,000
Stability modifications	85,000
Hangar	50,000
Lab and Workspace	100,000
A-Frame	815,000
Electro-mechanical	80,000
Tracking system	50,000
Engineering	30,000
Services	15,000
Total	$1,290,000
Bow thruster	150,000
Total	$1,440,000

R/V KNORR

Removals	$ 5,000
Tracks and Hatch	25,000
Structural:	80,000
Crane relocation	20,000
Stability modifications	75,000
Hangar	100,000
Lab and Workspace	100,000
A-Frame	815,000
Electro-mechanical	80,000
Tracking system	50,000
Engineering	65,000
Services	15,000
Total	$1,430,000

HLC 02/12/82

APPENDIX IV

DRAFT

NATIONAL SCIENCE FOUNDATION
DIVISION OF OCEAN SCIENCES
OCEANOGRAPHIC FACILITIES SUPPORT SECTION

The Oceanographic Facilities Support Section (OFS) of the Division of Ocean Sciences (OCE) welcomes two types of instrumentation proposals. One is for the acquisition of shared-use instrumentation as described in NSF 81-25, "Instructions for Preparation of Proposals Requesting Support for Oceanographic Instrumentation". A second and new type is for the development of shared-use instrumentation. Proposals should be directed to the development of technology or instrumentation for the delivery of scientific data for multiple users onboard or in conjunction with research vessels. Scientific projects benefiting from the instrumentation development must have direct relevance to the research activities funded by OCE. Instrumentation development may include, but need not be limited to, data collecting or observational systems, instruments to enhance present measurement capabilities, or data handling and communications equipment. Proposals for support of workshops to assess current status of technology and instrumentation and to recommend areas for future development may also be considered.

Normal criteria for evaluation of instrumentation proposals will include:

- -scientific/technological merit of research for which facility or technology is to be used
- -ability of the applicant(s) to undertake technology development
- -importance of the facility or technology to the successful completion of research for which it is intended
- -degree to which facility or technology meets the requirements of more than one user group

Proposals that include technology development of totally new, first time instrumentation, or instrumentation directly linked to a specific research project or goal, should be submitted to the Ocean Science Research Support Section (OSRS) as a regular research proposal. Joint funding may then be considered with OFS on a case-by-case basis.

There are no deadlines or target dates for FY 1982 and proposals should be formatted as a research proposal with emphasis on the points indicated above. Those persons intending to submit a proposal are urged to write or call H. Lawrence Clark, Program Manager for Oceanographic Technology (202-357-7837) with a statement of intent prior to developing a formal submission.

~~APPENDIX V~~

UNOLS Research Vessel Cruise Assessment

~~Feb. 1982~~

PI/SIC	Ship
PI/SIC Institution	General type of work and procedures employed
Area of operations	
Cruise, Expedition, and Leg #, and/or project name	
Dates of cruise	Was cruise successful in terms of your scientific project? Please circle best choice. FULLY / PARTIALLY / MARGINALLY successful / UNSUCCESSFUL (CAPS)
Days total	
Days transit	
Days stations	
Days underway surveying	

What ship did you request if not this one?_____

Were you given adequate advance information by the operator institution concerning equipment and technician services provided? NO/YES

Work lost because of weather: days_____ stations_____

Work lost because of ship, ship's equipment, or ship's personnel: days_____ stations_____

Work lost because of scientific equipment: days_____ stations_____

Factors adversely affecting cruise success (include percentage estimate if possible)

Please circle equipment used.

Main engine_____
Electric power_____
Officers & crew_____
Ship's technicians_____
Pre-cruise liaison_____
Crane or A-frame_____
Winches_____
Computers_____
Other electronics_____
Other (specify)_____

Comments, details of problems, suggestions, and praise, if appropriate, for both successful and unsuccessful cruises. Use other side and additional pages as necessary.

These evaluations are an attempt to assist ship users, operating institutions, and funding agencies to improve the quality of research vessel operations. Copies will be sent to the UNOLS Advisory Council and the operating institution only, but summarized edited data will be sent to all UNOLS members and associate members and funding agencies. Please fill out as completely and frankly as possible.

Revised 2/82

UNOLS - User Manual Report

I. Introduction

The UNOLS Advisory Council proposed a survey of UNOLS Vessel User Manuals at its August 1981 meeting. That proposal was based on the assumption that all UNOLS institutions provide a manual to acquaint users with the vessel, its operation and its facilities; but that there was wide variation in the kind and quality of information provided. To test these assumptions, user manuals were requested of all UNOLS member institutions in September 1981 and were reviewed by Dirk Frankenberg during Fall and Winter 1981-82.

The Advisory Council assumptions concerning UNOLS vessel user manuals were largely borne out by the survey. Twelve of the 17 UNOLS member institutions provided some sort of manual describing procedures for use of their publically supported vessels. Two institutions (Skidaway and the University of Texas) have no user manuals for their coastal zone vessels, but provide formal pre-cruise counseling for users. Three other institutions (Columbia, Duke/UNC and Johns Hopkins) are preparing user manuals for their current vessels. The remaining 12 UNOLS member institutions provide manuals for vessel users. These manuals range from a single 8 page flyer to 4 separate manuals covering different phases of ship operation. Thus existing UNOLS manuals are not standardized, and probably should not be. An analysis of the kind of information usually and occasionally provided by existing manuals is summarized below along with some recommendations of the UNOLS Advisory Council with respect to user manuals.

II. UNOLS User Manuals - Winter 1982

Existing user manuals for UNOLS institution vessels contain information on the physical characteristics and configuration of the vessel; technical facilities and instrumentation available and the procedures for gaining access thereto; policies for living aboard the vessel, and chief scientist responsibilities. User manuals sometimes contain lists of specific instrumentation available (by model name and number), model cruise reports, speed/fuel consumption charts, data on areas for which foreign nation's require clearance for research activities, function of the ship's agent, and many other items. These characteristics of user manuals will be surveyed below under the headings: A. Information Always Provided; and B. Information Sometimes Provided.

A. Information Always Provided

1. Characteristics and Configuration of the Vessel

Information on the vessel usually contains both a written description and diagrams of deck, laboratory and stateroom layout. Cross-section diagrams are sometimes provided (URI, Texas A&M, WHOI, etc.). The most useful written descriptions provide information not duplicated by diagrams (dimensions of laboratories, etc.), but supplemental information such as the ability to provide clean power, tie down mechanisms affecting the ability to reconfigure laboratory benchwork, etc. In addition, some descriptions include indications of where previous investigators have worked on large instruments, assembled moored instrument arrays, etc. Almost universally the written material provides a summary of the vessel's specifications (length, beam, speed, fuel and water capacities, range, etc.; as well as a description of deck equipment (winch, wire, A and J frames, etc.), communication equipment, navigation capabilities, ability to accomodate investigator-specific vans, etc. The manuals from Scripps Institution provide an alphabetized list of ship's facilities, a format that seems well suited to speedy information access as well as start-to-finish reading.

2. Technical Facilities, Instrumentation, and Access Thereto

Information on technical facilities usually includes information on technician groups (computer, electronics, shoreside instrument fabrication, engineering, geophysical data reduction, etc.), scientific instrumentation (sampling equipment for water column characteristics, biota, sediments, rocks; other over-the-side gear for collecting photographs, seismic profiles, magnetics, etc.); and laboratory equipment (spectrophotometers, radioactivity counting systems, computer, electronic test equipment, refrigerators and freezers for scientific use, etc.). In most cases technical support groups are described in writing while scientific sampling gear and laboratory instrumentation are summarized in a list. In some cases (Delaware, USC) the rental price per day and month for each piece of gear is also listed. This system seems likely to reduce confusion for users who are not sure what gear is included in the ship's basic charter fee.

In all cases, the procedure for obtaining access to various technical facilities and instrumentation is described although in many cases this information is separated from the lists of equipment and instrumentation and in some cases the procedural statement is something like "requests for technical support should be made well in advance through the scientific coordinator for marine operations." In most cases, submission of an "equipment to be used" form is part of the pre-cruise responsibilities of the chief scientist.

3. Policies for Living Aboard

All existing UNOLS vessel user manuals have a section describing shipboard living. All except Michigan's describes a "sea shower" and all caution against congregating on the bridge. Otherwise, these sections differ modestly from each other and all are designed to provide guidelines to diminish friction amongst ship inhabitants. As is fitting for an instrution near Boston, the WHOI manual delicately suggests that women handle the unusual amount of male attention they experience at sea with "persisten good judgment and good taste" and adds "when someone of the opposite sex is visiting you stateroom, gossip can be minimized by keeping the door open." Other matters generally described in this section include fire, life boat, and man overboard drills; meals; housekeeping; shipboard safety; alcohol and drug policy; swimming; insurance; suggested attire; entertainment. Sometimes these sections contain information about customs, immunization and other information useful when embarking or disembarking in foreign ports.

4. Chief Scientist Responsibilities

User manual sections on shipboard living sometimes include information on shipboard administration and chief scientist responsibilities. In most cases, however, this material is handled in a separate section. Scripps has a separate manual for the chief scientist organized into sections on pre-cruise, shipboard, and post-cruise requirements This may be overkill for some institutional situations, but a clear definition of chief scientist responsibilities is an essential part of user procedures.

B. Information Sometimes Provided

Information sometimes provided in UNOLS vessel User Manuals covers a broad range and is often institution-specific (for example, the Michigan manual has a unique section on cruises involving work in Canadian waters). Among the most useful of this informatio is a set of forms for shiptime request, pre-cruise plan (prospectus), foreign clearance

request, NOAA/NODC oceanography-general cruise inventory (ROSCOP II), institution and/or UNOLS ship operations report, cruise report and UNOLS cruise assessment form. These forms provide a great deal of useful, specific information on matters that are required of users before, during, and after cruises. The URI, Hawaii and OSU manuals are particularly good examples of this type of information presentation.

Other useful information sometimes provided in UNOLS user manuals includes that on van capabilities, sea water supply to wet laboratory, variation in electrical voltage and frequency, weight limits and distribution, copies and extracts of regulations pertaining to foreign clearance and obligations, customs and personnel clearance procedures, instructions for filling out forms, etc. One suspects that there is a trade-off between completeness of information provided and liklihood of complete reading and comprehension by the intended audience. Different compromises within this tradeoff spectrum should be anticipated and explain the variation amongst UNOLS institutions Vessel Users Manuals.

III. Recommendations

1. All UNOLS institutions should develop, maintain and provide a dated users manual for their publically supported facilities. This should be provided chief scientists well before embarkation.

2. UNOLS user manuals should contain descriptions of:

   a. the characteristics and configuration of the vessel - including deck layout diagrams, winch wire and J-A frame type and position, communication and navigation equipment;

   b. available technical support groups and instrumentation - including capabilities, instrument make, model and age, and procedures and costs for using these facilities;

   c. policies for living aboard - including policies on bunking, meals, courtesy, alcohol and drugs, drills, safety, etc.;

   d. chief scientist responsibilities - including relationship to Captain and crew, clearances, scientific personnel, customs and reporting; and

   e. request and report forms - including either instructions or a model that explains the type of information required on each section of the form.

   f. add names and or offices of institution representatives for specific information;

   g. perhaps an easier way of keeping a manual up to date would be to have a removable page with telephone numbers/addresses.

   h. publications should be dated.