UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

UNOLS Council Meeting

Summary Report

20 September 1999

National Science Foundation, Room 1235
4201 Wilson Boulevard
Arlington, VA

UNOLS COUNCIL MEETING
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Welcome and Introduction – The UNOLS Council met in Room 1235 of the National Science Foundation on 20 September 1999. Bob Knox, UNOLS Chair, called the meeting to order at 0830. The agenda, ***Appendix I***, was followed in the order reported below. The participants of the meeting are listed in ***Appendix II.***

Accept Minutes – The minutes of the July 1999 Council Meeting were accepted as written.

COMMITTEE REPORTS:

The UNOLS Committee chairs provided written reports of their respective committee see ***Appendix III***. Bob Knox provided a summary of these reports as noted below.

Arctic Icebreaker Coordinating Committee (AICC) – The AICC has primarily been concerned with the construction of HEALY which is currently in the midst of Builders' Trials. Delivery is scheduled for early November 1999. UNOLS and RVTEC are coordinating science systems testing. Jack Bash reported that special effort would be given to multibeam testing on HEALY. Warm water testing of the science equipment is scheduled for January/February in the Caribbean. Cold water tests will be held in late spring in the Baffin Bay area.

DEep Submergence Science Committee (DESSC) – Utilization of and interest in the deep submergence facilities is high. DESSC plans to focus on future deep submergence science directions and facility planning. A workshop titled Developing Submergence Science for the Next Decade "DESCEND" will be held to solicit plans from the community for the future of submergence science. The meeting is scheduled for 25-27 October.

Fleet Improvement Committee (FIC) – The FIC's primary effort is developing a web based Biennial Review document. This will provide a "living" document for assessing the state of the fleet and identifying future ship needs of the oceanographic community.

Research Vessel Operators' Committee (RVOC) – The RVOC written report discussed the plans for their Annual meeting to be held at Harbor Branch on 2-4 November. Topics such as international regulations and the NSF Review will be covered.

Research Vessel Technical Enhancement Committee (RVTEC) –The RVTEC written report provides plans for their upcoming annual meeting to be held in Port Aransas, TX on 20-22 October. It also provides details on the science systems testing for HEALY.

Ship Scheduling Committee (SSC) – Bob Knox summarized the committee report by explaining that there are still several pending projects. The NAVO work is likely to be funded at $3M compared to the $7.5M of the past several years. This shortfall will cause some ships to have light schedules. NSF projected Class I ship time in 2000 is greatly increased. Spreadsheets are attached to the SSC report and include a ship utilization spreadsheet for 2000, ship costs for 1999 and 2000 as well as a comparison of the two years, and NAVO priorities for 2000. Mike Prince reported that Joe Ustach (Duke/UNC) has been elected as the new Ship Scheduling Committee Chair. Dan Schwartz (UW) is the Vice Chair.

Federal Agency Discussion Period - Science program managers from the federal agencies were invited to raise any UNOLS related issues or topics of interest. No issues were raised at this time (the full agency reports will be provided at the UNOLS Annual Meeting).

UNOLS ISSUES:

NSF Academic Research Fleet Review - Don Heinrichs provided a summary of the findings of the NSF Academic Research Fleet Review. His viewgraphs are included as ***Appendix IV***. The findings are outlined below:

Principal Findings:

- Current practices provide excellent access to the sea for U.S. researchers
- UNOLS services are meeting community needs and costs are comparable to other government and commercial operators.

Recommendations:

- The UNOLS system should be retained.

Programmatic findings:

- Potential for a near-term period of reduced use of UNOLS fleet by NSF grantees.
- Need for a strong continuing program for technology introduction, improvement of existing capabilities, and more systematic approach to maintenance and upgrades.

- Need to enhance quality control, training and safety procedures, and to develop even higher standards for shared use facilities.

Recommendation:

- Launch a significant campaign to upgrade and strengthen the fleet to prepare for increasing technological sophistication and improve future productivity and quality of fleet operations.

Operational findings:

- Continue practice of competing the management of the UNOLS Office.
- Needs for specialized capabilities are met in special circumstances from outside the UNOLS system.

Recommendations:

- Use a cooperative agreement for support of the UNOLS Office to ensure necessary management oversight.
- Consider a trial including some commercial ship operators as UNOLS non-member operators to provide unique fleet capabilities.

Planning findings:

- Ocean scientists must assess the future needs and opportunities of the field to establish priorities. A broad vision is essential to anticipate future fleet requirements.
- Federal agencies must improve long range planning for facilities with twenty to thirty year life spans, beyond the scope of NSF and UNOLS alone.

Recommendation:

- NSF must accelerate and expand efforts to articulate a broadly based vision for the future of ocean science and technology.
- Federal agencies sponsoring research in oceanography should develop a long-range plan for modernization and composition of the oceanographic research fleet that reaches well into the 21st century.

Don reviewed the issues of particular interest to the Council. A general discussion followed Don's presentation. The Council was concerned with the recommendation to charter commercial ships. Don explained that the recommendation did not include bare-boat charters for which there are often safety concerns and the add-on costs to provide a fully found ship normally bring the cost equal to or greater than UNOLS vessels. Chartering should be for special needs, those beyond the capability of the UNOLS Fleet. An example would be giant coring from the MARION DUFRESNE or a multi-channel seismic ship.

Don explained that the user surveys, conducted as part of the review, repeatedly called out the reliability of shared-use shipboard systems as a major concern. The committee feels that NSF and UNOLS operators should examine equipment issues to see if a list of shared-use equipment for each vessel and class can be identified and a quality-based system adopted fleet-wide to ensure that this equipment gets proper logistical and technical support. This should be a council issue to work with operators and NSF to determine how ships can better support science. The question was asked about how to measure quality, what benchmarks should be used? If the fleet were to be held to a standard this would need to be quantified. These are things that can be and need to be

implemented by the UNOLS working groups. It is unlikely that new money will be available, but there will need to be some redirection of funds.

The user surveys voiced concern over accountability. What is the recourse of the user? Don suggested that each operator sit down with their respective ship committees to look over their operations and identify the areas that need improvement. Jim Swift noted that the AICC has been working with the USCG to ensure they will be operating in the UNOLS mode. Even if there were no more money, the Committee would argue that the community needs to put more a focussed management effort into the services support. Bob Knox asked the Council to think about concrete steps that can be taken in this direction.

The Review Committee was not satisfied with the cruise assessment response of 66%. It felt that a number closer to 100% should be pursued. At some institutions this objective is realized, at some it is not.

The recommendation for a Cooperative Agreement (CA) for the UNOLS Office came under discussion. Issues that will be included in the CA are an emphasis on cruise assessments, user support and technology improvements, evaluation of operator performance and continuous quality improvement. This improvement will include management training, continuous quality reporting and performance reporting. The cooperative agreement elements will be further discussed at the winter Council meeting.

NSF will be working with other federal agencies in developing a long-range strategic plan for fleet upgrades and replacement. This will be an agenda item at the upcoming FOFCC meeting.

Future Fleet and Facility Utilization/Planning Session:

UNOLS Biennial Review of Sea Going Oceanographic Facilities – Larry Atkinson began with an update on all FIC issues, see ***Appendix V***. The FIC has added two new members to their committee, Dave Brzezinski (UCSB) and Dave Hebert (URI). Over the past year they have been involved with advising on the AGOR 26 SWATH project. Additionally, work on the Alaskan SMR is complete and the document is in the hands of University of Alaska.

The Biennial Review is a web based document or information source for fleet planning. The report will assess the current fleet and identify the future ship needs of the oceanographic community. Larry provided an outline of the report and encouraged everyone to look it over. The report is divided into five sections: the future, general information on the UNOLS Fleet, specific topics - new types of vessels, fisheries and hydrographic surveying, and technical issues. Many of the authors have been identified, but there is also room for more. The document may identify the need for additional SMRs.

ALPHA HELIX Replacement - Leonard Johnson (U. Alaska) provided a brief report on the efforts to replace ALPHA HELIX. Discussions have been held between U. Alaska and NOAA on how a replacement ship might provide support for NMFS science requirements. Jim Meehan,

NOAA/NMFS, indicated that the first new FRV 40 being built will be going to Alaska but will be 100% utilized by NMFS, so that only piggyback UNOLS programs can be accommodated. Jim did say that NMFS has additional charter work that could be accomplished by an ALPHA HELIX replacement if the ship were outfitted for such service. A question arose as to whether U. Alaska's ship requirements could be met by another FRV 40. Concerns were raised about its ice strengthening and its limited lab spaces. Jim noted that there could probably be modifications to the ship to satisfy these concerns.

Bill Fox (NOAA) added that universities with an interest in fisheries are encouraged to contact NMFS. If these universities were thinking about designing new ships, they should consider a NMFS/NOAA partnership. NOAA often does not need a dedicated full time ship in an area, but could benefit by access during certain times of the year.

The planned construction time scale for the NOAA FRVs is to start construction of the first one in 2000 with an additional ship each year for the next three years.

East Coast Science Mission Requirements - Larry reported that the drafting of Science Mission Requirements for an East Coast ship has been tabled for the time being.

CAPE HENLOPEN Replacement – Dave McCarren (University of Delaware) reported that the University of Delaware is proceeding with plans to replace CAPE HENLOPEN, see ***Appendix VI***. Institutional funds are being sought to assist in the replacement effort. They will be surveying the CAPE HENLOPEN user base to assist in the development of mission requirements. Replacement is tentatively planned for 2008, which would allow a few years of design planning before construction begins. FIC will be kept appraised of the progress and periodically plans will be submitted for review. They are considering fuel cell technology for the ship. Additionally, they are hoping to be able to implement an advanced communications link for virtual science party participation. They envision a replacement of roughly the same size and working region as CAPE HENLOPEN.

NAVO/Navy Ship Time – Gordon Wilkes reported that the future for NAVO funding is unclear. Congress currently has $3M in the budget with an option to increase the amount to $7.5M. There is NAVO work if funds are available. NAVO requirements for the future are likely to settle at the $5M level for the next few years, provided the funds are available. Pat Dennis added that the NAVO funding of $3M would likely be applied to survey work as opposed to data processing in 2000. The future work will be diverse and include shallow, deep, range, Pacific and Atlantic work. There is also work that could be done by the UNOLS Fleet if the EEZ problem can be overcome. Rich Hayes-(Oceanographer's Office) indicated that we need to come up with a plan on how to proceed. No one should conceive of the NAVO work lasting forever, there might come a time when the all military survey requirements are met. All NAVO ships are forward deployed at this time.

(To accommodate various schedules, the following items were taken out of order from the printed agenda:)

UNOLS Brochure – The UNOLS brochure, being written and publish by Vicky Cullen of WHOI, has been delayed but should be completed by the end of the year. The text is nearly complete. Photos are still being gathered.

Public Outreach Plans – Jack Bash reported that the educational book from USF and Peter Betzer is progressing. It is expected to have eight to ten chapters. Jack will be writing the sidebars, which will have a UNOLS slant. The book is aimed for the middle school level. It will take approximately two years to write. Funding is by private source.

Other outreach plans include a UNOLS booth at the Fall AGU. We encourage Council members to stop by the booth.

Fleet Planning (continued)...

UNOLS Role in Observatories Support – Dan Schwartz introduced the topic of observatories and the potential role of UNOLS. Establishment of an observatory at Juan de Fuca is in progress. The observatory will be hard wired to shore. The question of the UNOLS ship role was asked. For this type of observatory, cable laying and maintenance may require UNOLS fleet support. This would be an appropriate use for the fleet, not much different in nature than deploying moorings. The community needs to determine what the role of the ships will be and how this will impact the need for ships in the future.

NOAA Fishery Needs – Bob Knox gave a brief background and status on the NOAA/NMFS AMLR program. This program is primarily for fisheries research in Antarctic. NOAA solicited the academic community for the AMLR ship support. WHOI and SIO submitted a joint proposal. NOAA indicated that the proposal was good, but the cost was too high. As a result, NOAA sent a request for proposals out commercially. WHOI and SIO again responded, however, were disqualified because the commercial solicitation indicated that the proposal must include a liquidated damages clause. WHOI and the University of California cannot legally comply with this requirement. The future status of AMLR with respect to UNOLS ships is unclear at this time.

Bill Fox noted that in the past, the AMLR work had been done by SURVEYOR at a cost of $2M per year. This is the level of funding available for the program. If all of the commercial proposals exceed this level, there may not be an AMLR program in the future.

Moorings as a Facility – At the last Council meeting, the topic of "moorings as a facility" was introduced by Dennis Hansell. A subcommittee was formed and they determined that the topic should be further examined. A mooring white paper was generated, see ***Appendix VII***. Unfortunately, Dennis Hansell could not attend this Council meeting due to Hurricane Gert. In general discussion it was noted that there is interest in long term moorings facilities. The topic needs to be looked at from an interdisciplinary perspective.

There will be a meeting immediately following the Annual Meeting in NSF Room 770. Bob Knox read an e-mail from Dick Pittenger concerning the moorings topic. He raised the question on whether or not this was an appropriate task for UNOLS. Additionally he raised the question and concern of whether this would strain the facility funds now available for ships. Don Heinrichs commented on the topic by noting that the NSF Fleet review committee was interested in seeing UNOLS being involved in other issues in addition to ships. Don referenced the name "UNOLS" and pointed out that it refers to laboratory systems and not specifically ships. It is time for an active dialog on these types of issues. Don views the test-bed, experimental type mooring facilities as potential UNOLS assets. Sandy noted that NSF already supports the Bermuda test-bed mooring.

New Ship Construction:

- SAVANNAH – Jack Bash reported that Skidaway has not yet awarded the construction contract for their new ship, SAVANNAH. There are some internal funding issues that need to be resolved. The ship has been designed and a shipyard was identified to build the vessel.

- CALANUS – Tom Lee reported that the CALANUS replacement ship is under construction at Eastern Shipbuilding Group. The delivery date is January 17th. Tom showed viewgraphs of the ship's layout, see ***Appendix VIII***. The ship is a catamaran and its features include:
  - Length = 96', Breadth = 40', and draft = 5'6"
  - Speed = 12 knots
  - a notched stern
  - 20 berths - 16 science party, 4 crew
  - moon pool
  - motion sensor system

  U. Miami has been funded for a CTD, 10-inch profiler, fiber-optic computer network, and a Chirp Sonar. They are also submitting a proposal for a multibeam system.

  Tom showed pictures of the ship being built. Construction began on April 23rd and is expected to take nine months for completion. The estimated cost for construction is $4.2M. A day rate of $6,600 has been estimated.

- **WHOI SWATH Plans**– WHOI has completed the design and model testing for their SWATH vessel. They are still identifying the funds needed for construction. Construction will not proceed until funds are available. They still have not decided whether or not to apply for UNOLS Vessel status. This will be decided when construction begins.

- **MTS SWATH session** – Jack Bash reported that two papers were delivered in the Ship Session of the Fall MTS Oceans conference in Seattle. One paper was on MBARI's WESTERN FLYER and the other paper was on the WHOI SWATH design. MBARI's deserves praise for identifying the ship problems and the remedies for them. MBARI is very

pleased with the corrections. One of the initial ship problems experienced was loud noise. The ship has been quieted and also was able to increase its speed capability. The number of frames on the vessel was doubled. MBARI was very open with the community about the nature of the problems. Their philosophy is to take chances and in doing this they have high risk involved in projects. One lesson learned during this process was that ship designs need to be thorough and firm prior to going into the construction phase.

AGOR 26 Construction Update – Sujata Millick reported the Navy is still in the process of trying to award a contract for construction of AGOR 26. The project has been negotiated and it is anticipated that the contact should be signed in the near future. [Note, a construction contract was awarded in November to American Marine Inc.] Once construction begins, it is expected to take 22 months for completion. Robert Hinton is the University of Hawaii on-site representative, Lockheed/Martin is the design contractor and the Atlantic Marine is the builder. Pete Conroy of NAVSEA continued the AGOR 26 report with the operational capabilities of the vessel, see ***Appendix IX***. The ship is designed to ABS and will be built to USCG Sub-chapter U requirements. Pete reviewed the operational capabilities as well as the mission equipment and ship systems. He showed charts of the seakeeping characteristics. The seakeeping analysis was conducted at zero speed. Pete provided various profiles of the ship with deck layouts. All of this material is included in Appendix IX. The cost of the entire AGOR 26 construction project is $54M. The AGOR 26 design will be discussed in detail at the FIC meeting in November.

SEA CLIFF Report – There is no new status to report on WHOI's SEA CLIFF engineering study. They hope to have an update at the December DESSC meeting.

ATV Report – Sujata Millick reported that ATV is operating on a very reduced schedule. Peter Lonsdale (SIO) used the vehicle in the spring with internal funds and was pleased with its performance. CORY CHOUEST has been serving as ATV's support platform. The future of the ATV is unclear at this time and no decision has been made by the Navy to retire the vehicle. The operating cost for the vehicle is now charged in full to the user; there is no longer a subsidy. Bob Knox recommended that if and when the Navy decides to retire the vehicle, they should let the community have an opportunity to respond. Sujata suggested that institutions interested in operating ATV should send their letters of interest to the Navy.

End Session on Future Fleet and Facility Utilization/Planning

Session on Ship Scheduling and Related Issues:

White Paper on Ship Scheduling – Jack Bash reported that the white paper on ship scheduling is still under development and is not available at this time. He will incorporate all comments received and then circulate it to the Council before posting it on the UNOLS website.

Progress Report on the New Ship Scheduling Procedures – Mike Prince provided the background and rationale for the new ship scheduling system. This year the full Ship Scheduling Committee met in mid July after many of the ship time funding decisions had been made.

Schedules were reviewed and modified based on the funding decisions. Following the July meeting, the schedules were smoothed out. The scheduling review group met in September in a brief meeting to resolve any remaining issues. Mike thought that the process worked well this year and proposed that we keep the system. The only recommended change might be to eliminate the September meeting of the review committee. If necessary, the key players with unresolved scheduling issues could meet at that time. The issue of ship time letters of intent needs to be re-examined to determine if it was the most effective process. The letters were drafted by the schedulers in the spring and included all potential ship time (these replaced the very preliminary schedules of the past).

Mike noted that we need to also look at the ship time request forms themselves. There is a lot of information that is needed to effectively plan for major field programs. Jack Bash reported that approximately 80% of the ship time requests are now being submitted electronically. He also noted that the ship schedules could now be submitted and posted electronically with hyperlinks to the individual PI ship time requests.

Post Cruise Assessment Reporting – Jack Bash reported that there haven't been any recent changes to the post cruise assessment reporting process. Since the fleet review will address this issue, he felt that it would be best to wait and see if any specific recommendations are made. However, this is an area that will be addressed by UNOLS in the future with the ultimate goal of increasing the PI reporting level. Charlie Flagg indicated that his wife has professional experience in this field and is willing to assist. Jack noted that he has taken her suggestions for improving the report form and will apply them. Bob Knox asked Don Heinrichs what NSF would like to gain from the assessment process and in what timeframe? NSF will likely ask the operators, as part of their Cooperative Agreements, to respond to any negative assessments. Mike Prince said that for PIs to take the trouble to fill out the forms they must be assured that the reports are being reviewed and applied. UNOLS Office Cooperative Agreement might require a performance review of the operators in their role of assessment response.

There was a great deal of discussion on how to increase the submission level of the assessment reports and what type of data needs to be included in the reports. Many times the things being reported to the agencies or off-line to the operators are not on the form. We need a way to collect all data and respond to it. Somehow, the operator will need a more definitive method to assess their operation. Mike Prince indicated that we need to define a quantitative measure for measuring success. If the new assessment is made quantitative, the summary reports could easily be generated and the performance percentages quickly accounted for. Tom Lee indicated that there should be a header on the assessment form emphasizing that its information will be used for ship improvements and upgrades. The topic of anonymity was discussed. It was suggested that perhaps this role of watchdog should be given to the FIC.

Beth White reported that NOAA would provide a report on their shipboard logging system at the RVOC meeting. Their system might provide suggestions for improving the assessment process.

End of Session on Scheduling and Related Issues

UNOLS Office Transfer – UNOLS Office sent a message to the UNOLS membership after the last Council meeting asking for their concurrence to the selection of Moss Landing Marine Lab as the new host institution for the UNOLS Office. August 27th was the deadline for membership response and no negative responses were received. Bob Knox informed MLML of the membership approval. Mike Prince has submitted the Office proposal to NSF via Fastlane. Mike will visit the UNOLS Office at URI in October. He has been invited to attend all of the UNOLS meetings to get more familiar with the process. Mike is already very familiar with the Council, RVOC, RVTEC, and SSC. He has not attended DESSC or AICC meetings. The MLML proposal includes retaining Annette DeSilva as Assistant Executive Secretary. She will stay at URI. Don Heinrichs reported that the proposal would still need to be merit reviewed by all of the sponsors.

Winch and Wire Symposium – Jack Bash reported that plans for the Winch and Wire Symposium are well underway. Heroes have been selected for six different categories: the four basic science disciplines, one operator, and one ocean engineering. A winch and wire questionnaire was developed and distributed to the community. Questionnaires will be used by each hero to compile a two-page issues paper. The speakers will be asked to address these issues. The symposium is planned for 30 November to 1 December at Tulane University in New Orleans. This will allow participants to also attend the workboat show which will immediately follow the symposium. Most of the workshop speakers from industry are planning to attend the show as well. This will help to keep travel expenses to a minimum.

Dolly noted that winch problems are common in the fleet, but are often left off the assessment forms. Dolly encouraged spreading the word to the community, especially the scientists who have been complaining about the winches to attend the symposium.

DESCEND Workshop – Patty Fryer reported on plans for the "Developing Submergence Science into the Next Decade, DESCEND" workshop. At this time approximately 88 participants have pre-registered and of these roughly 60 are scientists. Patty reviewed the meeting tentative agenda – the first day will begin with a series of introductory presentations on submergence science and facilities. Most of the remainder of the day will be devoted to five breakout science sessions: Ridge, Abyss, Margins, Coastal, and Polar. Each participant will be assigned to a session prior to the workshop. Ridge is very popular and as a result will be split into two sessions. The coastal and polar sessions will be combined into one session. There will be two session leaders assigned to each session. In the late afternoon, we will ask the session leaders to provide a summary of their discussions in a general plenary session. The second day will have the same format as the first day, but will be devoted to technological sessions. The sessions are being split up by processes: event response, time series long and short, expeditionary, and global.

On the third day there will be a wrap up session in the morning. Jim Bellingham will provide insight into technology costs and realities. The afternoon will be devoted to the workshop report writing by the steering committee.

UNOLS/NMFS Memorandum of Understanding (MOU) – The UNOLS/NMFS MOU is under consideration by the NMFS. They received the draft just prior to the Council meeting. The Council endorsed the draft prior to it being sent to NMFS.

UNOLS/NOAA-OAR MOU – The UNOLS/OAR MOU is up for its two-year review. At the July Council meeting, the Council voted to readopt the MOU. The MOU is in Jim Baker's office (NOAA) awaiting signature at this time.

Application for UNOLS Vessel Status - The University of Miami has applied for UNOLS vessel status for their CALANUS replacement. The Council discussed the application and a motion was approved subject to the vessel passing the requisite inspections.

Winter UNOLS Council Meeting – The schedule for the next Council meeting was briefly discussed. It was recommended that the week of 24 January be avoided since this would coincide with the Ocean Sciences Conference. It was also recommended to avoid the HEALY warm water testing schedule. MLML was suggested as a potential meeting site.

The meeting was adjourned at 5:00 pm.

Appendix I

9/16/99

A UNOLS Wine and Cheese Reception will be held following the Council Meeting from 6:00 – 8:00 pm at the Arlington Hilton & Towers, Gallery I (second floor).

UNOLS COUNCIL MEETING

8:30 a.m., Monday, September 20, 1999
National Science Foundation, Room 1235
4201 Wilson Boulevard
Arlington, VA

8:30 am **Call the Meeting:** Bob Knox, UNOLS Chair, will call the meeting to order at 8:30 a.m., September 20, 1999.

8:40 am **Accept Minutes of the July 1999 Council Meeting.**

8:45 am **COMMITTEE REPORTS:** Bob Knox will provide a brief summary of the UNOLS Committee written reports and open the floor to a question/answer period. (Prior to the meeting, Committee Chairs submitted written reports on activities since the July Council meeting for distribution to meeting participants.) Chairs will identify any important issues that need to be addressed further by the Council. ***10 minutes per report for presentation and discussion combined, six committees.***

9:45 am **Federal Agency Discussion Period:** This is an opportunity for science program managers to raise UNOLS related issues or topics of interest. The full reports from Agency Representatives will be provided at the Annual Meeting on 21 September.

10:00 am **Morning Break**

UNOLS ISSUES:

10:20 am **NSF Academic Research Fleet Review** – NSF will provide a brief report on the NSF Academic Fleet Review, a full report will be provided at the Annual Meeting. Future implications of the recommendations will be discussed. In particular, the recommendation to fund the UNOLS Office by cooperative agreement rather than a grant will be addressed, as well as the Council's role in this process.

Future Fleet and Facility Utilization/Planning Session

11:30 am **The UNOLS Biennial Review of Sea Going Oceanographic Facilities** – Larry Atkinson will review the outline of the FIC report, *UNOLS Biennial Review of Sea Going Oceanographic Facilities.*

11:45 am **NAVO/Navy Ship Time** – The future course of NAVO/Navy needs for use of UNOLS ships will be discussed.

12:00 pm **Lunch Break**

1:15 am **NOAA Fishery Needs** – Bob Knox will report on the status of NOAA's AMLR work off the Antarctic. A discussion on potential future fisheries work by UNOLS vessels will follow.

1:35 pm **Moorings as a Facility** – Dennis Hansell will report on activities since the last meeting regarding the concept of running deep-sea moorings as facilities.

1:50 pm **New Ship Construction** - Updates since the July Council meeting on the status of:

- Skidaway's plans for construction of R/V SAVANNAH
- Miami's construction of CALANUS' replacement
- Replacement of CAPE HENLOPEN
- WHOI's plans to build a SWATH vessel
- MTS SWATH session

2:10 pm **AGOR 26 Construction Update** – Sujata Millick will provide the ONR/NAVSEA Phase I/II project status of the AGOR 26 SWATH research vessel.

2:30 pm **SEA CLIFF and ATV Report** –
SEA CLIFF - The status of WHOI's DSV SEA CLIFF engineering study will be reported.
ATV – Sujata Millick will report on the Navy's future plans for ATV.

End Session on Future Fleet and Facility Utilization/Planning

2:40 pm **Afternoon Break**

<u>Session on ship scheduling and related issues</u>

3:00 pm **White Paper on Ship Scheduling** – Jack Bash will review the latest modifications to the White Paper on ship scheduling.

3:15 pm **Progress Report on the New Ship Scheduling Procedures** – Mike Prince will report on the new ship scheduling procedures which were implemented this year on a trial basis

3:30 pm **Post Cruise Assessment Reporting** - Jack Bash will report on the subcommittee's activities regarding the development of an electronic database system for collecting and summarizing Post Cruise Assessments.

End of session on scheduling and related issues

3:50 pm **UNOLS Office Transfer** – The proposal from MLML to host the UNOLS Office has been endorsed by the UNOLS membership. Mike Prince will serve as the new Executive Secretary starting 1 May 2000. He and Jack Bash will discuss plans for the Office transfer.

4:05 pm **Winch and Wire Symposium** – Jack Bash will report on plans underway to conduct a Winch and Wire Symposium in the fall.

4:20 pm **DESCEND Workshop Plans** – Patty Fryer will report on plans for the DEveloping Submergence SCiencE into the Next Decade, DESCEND. The workshop is planned for October 25-27, 1999.

4:35 pm **Application for UNOLS Vessel Status** – The University of Miami, has applied for UNOLS Vessel Status for their CALANUS replacement vessel. (see handout). The Council will discuss the application.

4:50 pm **Public Outreach Plans** – Jack Bash will review 1999 public outreach projects and plans for the future: Betzer Book, UNOLS Brochure, Fall AGU, and UNOLS Tutorial on CD-ROM.

4:55 pm **UNOLS/NMFS Memorandum of Understanding (MOU)** – Jack Bash will review the status of the draft MOU between NMFS and UNOLS.

5:10 pm **Two-Year Review of the NOAA/OAR and UNOLS MOU** – Review of the UNOLS and NOAA/OAR MOU is required every two years. At the July meeting, the Council readopted the MOU. The status of the MOU readoption by NOAA/OAR will be provided.

5:20 pm **UNOLS Brochure** – A status report on the UNOLS brochure update will be provided.

5:25 pm **1999 Annual Meeting Plans** – Any last minute plans or agenda items for the 1999 Annual Meeting will be discussed.

5:30 pm **Adjourn**

Calendar for UNOLS Meetings

MEETING	LOCATION	DATES
Scheduling Review	Arlington, VA	9 September 1999
UNOLS Council	Arlington, VA	20 September 1999
UNOLS Annual	Arlington, VA	21 September 1999
RVTEC	Port Aransas, TX	20-22 October 1999
DESCEND Workshop	Arlington, VA	25-27 October 1999
RVOC	Fort Pierce, FL	2-4 November 1999
FIC	Moss Landing, CA	9-10 November, 1999
Winch & Wire Symposium	New Orleans. LA	Tentatively 1-2 December 1999
DESSC	San Francisco, CA	12 December 1999
AICC	TBA	TBA

Appendix II

Council Meeting - September 20, 1999

NAME	AFFILIATION	PHONE/FAX/INTERNET ADDRESS
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Pat Cooper	U of Hawaii	(808) 926-9513/(808) 956-9152/cooper@soest.hawaii.edu
Tim Cowles	OSU	(541) 737-3966/(541) 737-2064/tjc@oce.orst.edu
Patrick Dennis	ONR/CORE	(703) 696-2161/(703) 696-2007/dennisp@onr.navy.mil
Annette DeSilva	UNOLS	(401) 874-6825/(401) 874-6167/unols@gso.uri.edu
Dolly Dieter	NSF	(703) 306-1577/(703) 306-0390/edieter@nsf.gov
Charles Flagg	BNL	(516) 344-3128/flagg@bml.gov
John Freitag	URI	(401) 874-6579/(401) 874-6578/jfreitag@gso.uri.edu
Patricia Fryer	U of Hawaii	(808) 956-3146/pfryer@soest.hawaii.edu
Matt Hawkins	U of Delaware	(302) 645-4320/(302) 645-4006/hawkins@udel.edu
Richard Hayes	Oceanographer of Navy	(202) 762-1041/(202) 762-1043/hayes.richard@hq.navy.mil
Leonard Johnson	U of Alaska	(301) 464-6724/GLJGERGI@aol.com
Tom Lee	U of Miami	(305) 361-4046/tlee@rsmas.miami.edu
Paul Ljunggren	LDEO	(914) 365-8845/(914) 359-6817/pwl@ldeo.columbia.edu
Jim Meehan	NMFS	(301) 713-2363/(301) 713-1875/James.M.Meehan@noaa.gov
Dave McCarren	U of Delaware	(302) 831-8255/mccarren@udel.edu
Bill O'Clock	NOAA/ONCO	(301) 713-3435x146/James.W.O'Clock@noaa.gov
Tim Pfeiffer	ONR	(703) 696-6999/timothy_pfeiffer@onr.navy.mil
Dave Powell	U of Miami/RSMAS	(305) 361-4832/(305) 361-4174/dpowell@rsmas.miami.edu
Mike Prince	MLML	(831) 633-3534/(831) 633-4580/prince@milm.calstate.edu
Mike Purdy	NSF/OCE	(703) 306-1580/mpurdy@nsf.gov
Clare Reimers	Rutgers	(732) 932-6555x236/reimers@ahab.rutgers.edu
Tom Royer	ODU	(757) 683-5547/(757) 683-5550/royer@ccpo.odu.edu
Daniel Schwartz	U of Washington	(206) 543-5062/(206) 543-6073/schwartz@ocean.washington.edu

Tom Shipley	U of Texas	(512) 471-0430/tom@utig.ig.utexas.edu
Holly Smith	NSF	(703) 306-1576/(703) 306-0390/hesmith@nsf.gov
James Swift	SIO	(858) 534-3387/(858) 534-7383/jswift@ucsd.edu
Shozo Tashiro	JAMSTEC	(81) 468-67-5652/(81) 468-66-4600/tashiro@jamstec.go.jp
Paul Taylor	NAVOCEANO	(228) 688-5843/taylorp@navo.navy.mil
Joe Ustach	Duke	(252) 504-7579/(252) 504-7651/joeu@duke.edu
Beth White	NOAA/OAR	(301) 713-2465x184/elizabeth.white@noaa.gov
Gordon Wilkes	NAVOCEANO	(228) 688-4376/wilkesq@navo.navy.mil

Appendix III

UNOLS
Committee Reports

September 1999

Arctic Icebreaker Coordinating Committee
Deep Submergence Science Committee
Fleet Improvement Committee
Research Vessel Operators' Committee
Research Vessel Technical Enhancement Committee
Ship Scheduling Committee

UNOLS Arctic Icebreaker Coordinating Committee

Report to the UNOLS Council
September 10, 1999
James H. Swift, Chair AICC

The UNOLS Arctic Icebreaker Coordinating Committee (AICC) has had few activities since the last report in June. Reports received from the HEALY construction team indicate that USCGC HEALY is in the midst of builder's trials, including running in the Gulf of Mexico near the Mississippi delta. Both successes and problems have been noted in these reports, which have generally had a positive tone. An updated evaluation of status is expected by late October. One Coast Guard report did note: "Still anticipate being ready for NSF funded Arctic science CY2001".

Other recent AICC business has mostly centered on various email discussions of scientific equipment for USCGC HEALY and the Polar-class icebreakers.

Principal AICC activities in the coming months include:

- announcement of the 2000 Arctic Science-of-Opportunity cruise,
- an informal AICC meeting (no UNOLS travel support) on 19 October at Old Dominion University, ahead of the NSF Ocean-Atmosphere-Ice Interactions All-Hands meeting in Virginia Beach, 20-22 October,
- AICC representation at a panel discussion on Arctic logistics at the OAII meeting,
- AICC representation at the USCGC HEALY Ice Trials Meeting 27-28 October in New Orleans,
- plans for a community long-term planning workshop on Arctic icebreaker use at the 1999 Fall AGU meeting,
- plans for an AICC meeting in January 2000*, and
- extensive AICC participation in Coast Guard sea trials of USCGC HEALY during 2000.

[*The AICC meeting is proving difficult to schedule due to conflicts, especially with the HEALY tests and trials.]

DESSC Report to the UNOLS Council

Sept 10, 1999

Patricia Fryer, DESSC Chair

At its July meeting the DESSC heard the National Facility operator's report including the operations summary of a very successful 1998-1999. Also reported were operational summaries of other deep submergence activities including those of MBARI, MPL, the Navy, and ROPOS. We heard reports from the funding agencies NSF, ONR, and NOAA. The committee discussed revisions to the DESSC "Terms of Reference" and a revised document is being prepared for circulation to DESSC for comment. The final draft will be forwarded to the UNOLS Chair by the end of the year for consideration.

Scheduling discussions for deep submergence assets for the year 2000 and beyond emphasized the heavy use of these tools and highlights the increased level of funding of highly ranked deep submergence proposals. The committee discussed devising a mechanism for dissemination of information related to funded programs to potential PIs so that researchers will have the opportunity to plan collaborative work and to organize expeditionary science. Long-range planning issues discussed included science/logistical constraints, different vehicle requests, future global deep submergence initiatives in the Western Pacific, Indian Ocean, S.EPR, Mediterranean, Polar Regions (DESSC identified a set of "area champions"), and the HURL RFP for Hawaii and Western Pacific initiatives. The DESSC is exploring ways to disseminate information to the deep submergence community regarding funded programs in order to facilitate collaborative research and greater success in proposing expeditionary science.

With an over subscribed schedule, the DESSC discussed future funding for deep submergence science (possible new mechanisms). Upgrades to National Facility vehicles, science sensors, and ATLANTIS were summarized by WHOI personnel and a detailed report was presented on the status of current upgrades proposed for the JASON ROV. We heard a report on the SEA CLIFF engineering study and a review of backlog items and pending projects of R/V ATLANTIS

DESSC discussed membership replacements for three of its retiring members. Several applications had been received from the community at large, but none fit the requirements for expertise that the committee will be losing. Thus, nominations were made from the floor and these individuals are being contacted. The DESSC will vote shortly on nominees and forward recommendations for new members to the UNOLS Chair for consideration.

DESSC discussed the DESCEND Workshop plans and the role of DESSC in preparation for and as follow up after the Workshop. DESSC will provide a critical watchdog to ensure that recommendations from the Workshop are carried out over the next few years. It will be instrumental in channeling suggestions from the community to National Facility operators and in helping to coordinate efforts toward improved deep submergence science throughout the community.

An announcement regarding the DESCEND workshop was sent out from the UNOLS office, following the DESSC meeting. Applications were solicited on line and all abstracts from potential participants, outlining their views regarding the scientific goals of their research and the technical advances they see as needed in the future, are viewable at the site. The deadline for applications to attend has past and a total of 86 scientists, engineers, technicians and administrators have applied to attend the meeting. The organization of the participants into break-out sessions is underway. Leaders have been chosen for each session. These individuals will meet with the steering committee in the evening prior to the Workshop to finalize coordination of the Workshop effort. We intend that a draft report will be finished by the Workshop Steering committee before they depart Arlington on Wednesday Oct. 27th. This report, we hope, will be ready for distribution at the DESSC meeting on Dec. 12 in San Francisco.

Fleet Improvement Committee
Report to UNOLS Council

Submitted by Larry Atkinson

FIC's main activities are preparing the Biennial Review, advising on the Hawaii AGOR 26 process, reviewing other SMR's and recruiting new members.

The Biennial Review is now on the UNOLS/FIC web site. Instructions for authors have been developed and the search is on for authors. We anticipate some initial products before the millennium.

The AGOR 26 process continues. FIC will have another review at the next FIC meeting in Monterey on 9-10 November.

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13 September 1999

From: Paul Ljunggren, RVOC Chairman

To: UNOLS Council

Subj: RVOC Report
UNOLS Council Meeting - 20 September 1999

The 1999 RVOC Annual Meeting will be hosted by Harbor Branch Oceanographic Institute from on 2-4 November. The agenda includes a presentation by Jamestown Marine on Computerized Maintenance Systems, discussion of the Academic Fleet Review, and a presentation on the National Marine Fisheries Service's planned fishery research vessel, the FRV(40).

At the last meeting of the UNOLS Council the change to the RVOC Safety Standards were approved. As recommended by the Council an Index for the Safety Standards is being developed. The Safety Standards have been reviewed with a list of key topics being identified and the list of reference pages for each topic are being compiled.

The Safety Committee met in August at URI to review regulatory issues that required clarification. The committee noted when referring to the applicability of the regulations to vessels the regulations and international standards use terms such as "commercial vessels", "cargo vessels", etc. Use of such terms can provide for an interpretation in the narrowest sense which excludes most research vessels or in the broadest sense an interpretation in which it would be appropriate to include oceanographic research vessels. This is of greatest concern for uninspected vessels specifically with the international standards that have come into force and the practice of port state control. The Safety Committee plans to identify the areas of concern in a letter to the UNOLS Office and recommend that a Admiralty attorney review them and advise us whether or not research vessels fall under these guidelines. Once this review is completed the next step would be to address any unresolved issues to the Coast Guard.

An ongoing effort has been the preparation of a Small Research Vessel Primer. David Powell of RSMAS has been coordinating this effort. All, but one of the chapters in this collaborative effort have been completed. Among the topics to be covered are Requirements & Capabilities; Regulatory Issues; Safety; Stability & Seakeeping; Design & Construction; Conversion vs. Construction; Outfitting; SWATH Vessels; Catamarans; Selected New Designs; and Inventory of Small R/V's.

Sincerely,
Paul Ljunggren

Committee report from RVTEC to UNOLS Council 20 September, 1999

Plans for the 1999 RVTEC meeting in Port Aransas, Texas are beginning to take shape. The anticipated program will include a tutorial/work session on the implementation of netCDF as a UNOLS data standard and the ramifications of such a move. This has been a hot button issue off and on as there is increasing pressure from the community to move toward a uniform data set provided from ships to the science parties. The FIC formally, at last year's fall council meeting requested that RVTEC consider such a move. This has proven unpopular and difficult in the past due to differing computer platforms used for data collection and the wide variety of distribution media utilized. We have nearly succeeded in acceptance of the CDROM as a media and the logical next step is uniformity of data archiving. We also expect to have a program presenting advancements in data collection methodology and transmission. Two short presentations by working scientists presenting viewpoints from the consumer side have been scheduled, one is on new applications of underway surface meteorological data (e.g. IMET) and efforts to archive and promote these type of data and Lessons learned on how to set up data systems to measure true (earth-relative) winds. The second presentation is on ARGO. This is a large-scale float experiment that will involve many Marine Techs over the next few years. Our Vice Chair Tony Amos of UT has been working with Annette from the UNOLS office in setting up the logistic and social parts of the program which will include a reception at Aransas lighthouse. The meeting will convene on 20 October and conclude on 22 October.

Progress is being made on HEALY science trials in conjunction with the AICC. HEALY completed builder's sea trials on 2 September and the delivery date is expected to remain 29 October. This will place the Warm Water trial period sometime in January. This will mark the first direct UNOLS/AICC team involvement in the formal trials. The delays to date have been due to the inability to maintain the testing schedule upon which the original delivery date was predicated. Many of the problems with the propulsion system have been worked out and the winch system has undergone its first round of testing on the BST.

The prime goal of the Warm Water portion of the Sea Trial will be calibration and testing of the Multibeam Sonar system and its interaction with the Science Data Network. A working sub-group has been set up to consider and schedule Sea Beam – SDN testing. This group met last week in Seattle to work out a testing schedule and the various technical aspects of the problem. Preliminary testing of the other science system will also begin at this point with CTS systems and deep sea winch control being the other top agenda items. The true Science testing cruise will begin later in the Spring and is being conducted in the manner of a standard science mission. At this time it is unclear whether this testing will take place in Northern Canadian or Alaskan waters. UNOLS vessels have continued to host US Coast Guard Marine Science Technicians on board UNOLS vessels for familiarization purposes. This program has proven to be highly successful and will help to insure that technician support on HEALY is conducted in a similar fashion to that experienced by investigators on UNOLS vessels.

Submitted,
John S. Freitag
Chair, RVTEC

Ship Scheduling Committee Report

The Ship Scheduling review meeting was held at NSF on Thursday Sept. 9th. Attached are spreadsheets that show the utilization of the fleet for 2000 by agency and the costs of fleet operations for 1999 and 2000. Schedules will be refined and modified as a result of the review and cost figures will change somewhat as time goes on. The total number of days for the fleet is increased by around 350 days of which almost 200 is in the Class I vessels over what is projected for 1999. More significant is the fact that NSF's proportion of Class I ship time is greatly increased while Navy and NOAA use of the large vessels is down in 2000. The result is that the current projection for NSF ship operations cost is around 35 million. This is far more than it has been in the past and could present some difficulties. This increase in NSF supported work requiring large ships in 2000 does not include several projects that are being deferred to 2001 because of scheduling considerations.

Partial year lay-ups may be needed for EWING, THOMPSON and OCEANUS. The current schedules include some but not all of the work that NAVO would require if they get a full $7.5 million in funding. All of the high priority projects have been scheduled. If funding comes in at less than $7.5 million then the lower priority projects will have to be removed from the schedules. If full funding is received then there are several projects, not currently on schedules, that could be accommodated if needed. A spreadsheet showing the NAVO priorities and how they are scheduled is attached.

Results of elections for Scheduling chair and vice chair will be announced at the Council meeting.

Submitted by,
Mike Prince, SSC Chair

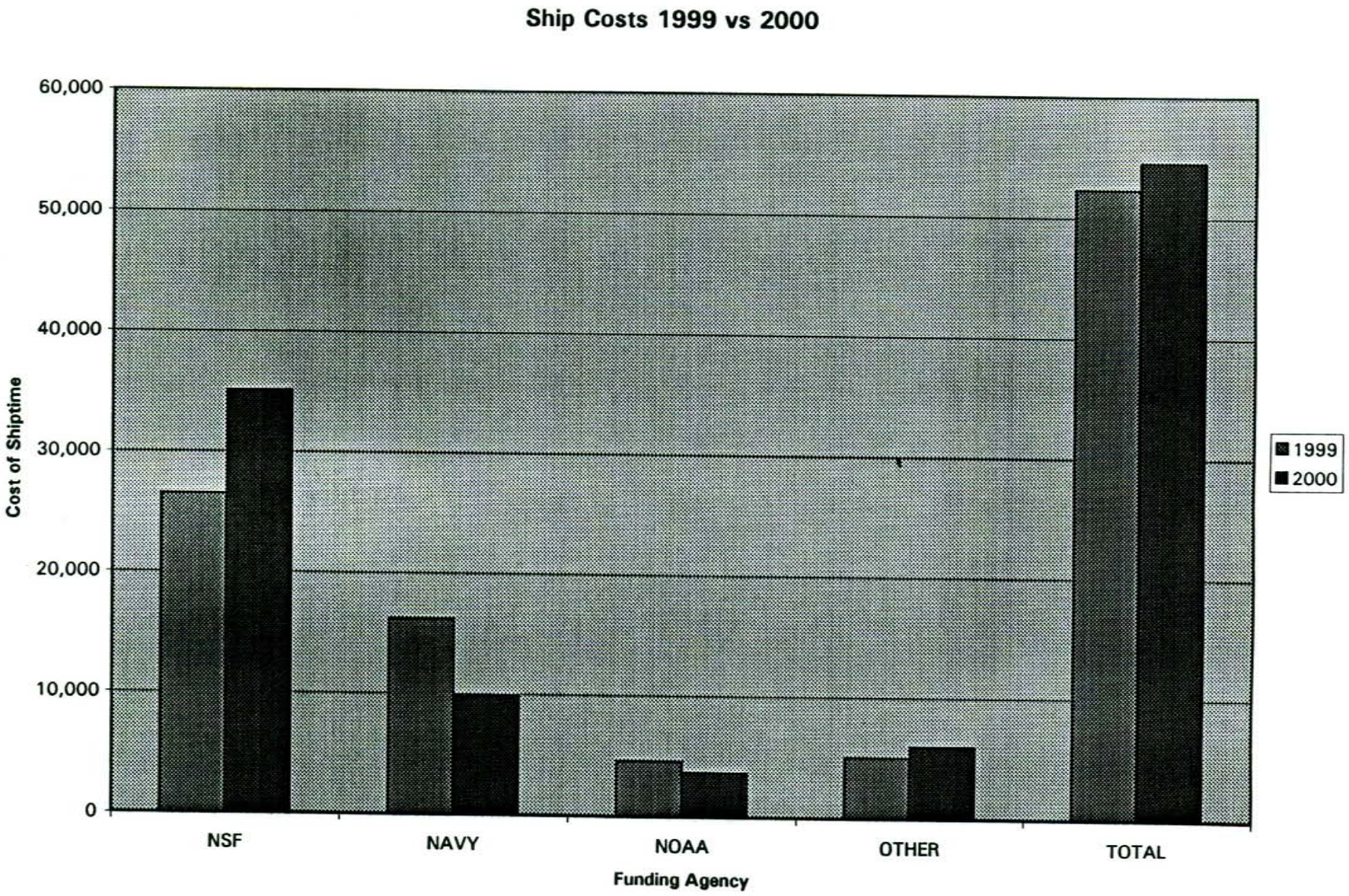
2000 UNOLS Ship Utilization

		Class	Updated	NSF	Navy	NAVO	NOA	Inst	Other	Total	Funded	% Funded
Atlantis	WHOI	1	09/02/1999	262			19		22	303	227	75%
Ewing	LDEO	1	08/29/1999	253					7	260	253	97%
Knorr	WHOI	1	09/02/1999	265	57					322	170	53%
Melville	SIO	1	09/06/1999	244			18	4		266	221	83%
Revelle	SIO	1	08/31/1999	206	107					313	304	97%
Thompson	UW	1	08/22/1999	81	20	50	10	66	28	255	169	66%
Endeavor	URI	3	08/30/1999	98	85	20	26			229	164	72%
Gyre	TAMU	3	09/02/1999	10	55			14	67	146	79	54%
Horizon	SIO	3	09/02/1999	54		30	23	38		145	92	63%
Johnson	HBOI	3	09/07/1999	168	4		86		1	259	172	66%
Link	HBOI	3	09/07/1999	53	72				45	170	124	73%
Oceanus	WHOI	3	09/06/1999	110	91		6		5	212	136	64%
Wecoma	OSU	3	09/12/1999	140	21		39			200	192	96%
Alpha Helix	U of Alaska	4	09/02/1999	95	0	0	21	1	29	146	78	53%
Hatteras	Duke	4	08/05/1999	103	17	30	31	10	9	200	83	42%
Henlopen	U of Del	4	08/26/1999	147	37				4	188	174	93%
Pt Sur	MLML	4	09/12/1999	42	56			15	54	167	90	54%
Sproul	SIO	4	08/30/1999	49	33			12	15	109	77	71%
Weatherbird	BBS	4	08/22/1999	130						130	130	100%
Barnes	UW	5	09/07/1999	36	5		10	13	10	74	32	43%
Blue Fin	Skidaway	5	09/07/1999	79	8		25		5	117	91	78%
Calanus	Miami	5	09/02/1999	45	26	35	61	6		173	136	79%
Laurentian	U. Mich	5	07/06/1999	232						232	232	100%
Longhorn	U of T	5	09/06/1999	20		30		28		78	78	100%
Pelican	LUMCON	5	09/02/1999	80	21	60	50	2	27	240	122	51%
Sea Diver	HBOI	5	09/07/1999	26	62					88	88	100%
Uracca	STRI	5	09/02/1999	15				105		120	15	13%
Totals				3043	777	255	425	314	328	5142	3729	73%
% of Total				59%	15%	5%	8%	6%	6%			

01/04/2000

YEAR:	1999													
As of:9/8/99														
		NSF			NAVY			NOAA			OTHER			TOTAL	DAILY
SHIP/CLASS	DAY	$		DAY	$		DAY	$		DAY	$		DAY	$	RATE
R. REVELLE *	2	34		262	4,268		0	0		21	355		275	4,647	16,898
MELVILLE *	185	3,035		86	1,410		21	344		8	131		300	4,920	16,400
KNORR *	0	0		0	2,065		0	0		0	0		0	2,065	#DIV/0!
ATLANTIS *	277	4,377		0	0		58	885		2	31		336	5,293	15,800
EWING *	307	4,554		0	0		0	0		24	356		331	4,910	14,834
T.G. THOMPSON **	58	984		77	1,307		55	926		36	594		225	3,810	16,971
MOANA WAVE *	38	516		11	149		12	163		0	0		61	828	13,574
CLASS I/II	867	13,500		426	11,188		144	2,317		90	1,467		1,527	28,472	18,652
AVE: (7)	124	1,929		61	1,313		21	331		13	210		254	4,068	15,746
EDWIN LINK *	73	664		12	109		0	0		75	683		160	1,456	9,100
ENDEAVOR	189	1,881		0	0		24	239		0	0		213	2,120	9,953
OCEANUS *	150	1,695		19	215		0	0		5	56		174	1,967	11,305
GYRE *	10	72		80	624		0	0		97	753		187	1,449	7,749
NEW HORIZON *	94	818		72	626		23	200		40	348		229	1,992	8,699
SEWARD JOHNSON *	131	1,284		60	588		22	216		0	0		213	2,088	9,803
WECOMA **	41	449		44	482		92	1,008		0	0		177	1,939	10,955
CLASS III	688	6,863		287	2,644		161	1,663		217	1,840		1,353	13,010	9,616
AVE: (7)	98	980		41	378		23	238		31	263		193	1,859	9,652
PELICAN **	71	267		101	379		37	139		29	109		238	894	3,756
LONGHORN	14	56		0	0		0	0		35	140		49	196	4,000
POINT SUR *	49	332		79	536		2	14		49	332		179	1,214	6,782
CAPE HATTERAS **	52	431		92	762		0	0		19	157		163	1,350	8,282
ALPHA HELI *	145	1,307		0	0		14	126		6	54		165	1,487	9,012
R. SPROUL *	97	592		11	67		0	0		43	262		151	921	6,099
CAPE HENLOPEN	106	585		67	370		0	0		11	61		184	1,016	5,522
WEATHERBIRD II **	138	1,038		0	0		0	0		4	31		142	1,069	7,528
SEA DIVER *	25	120		38	173		0	0		0	0		61	293	4,803
CLASS IV - TOTAL	697	4,728		386	2,287		53	279		196	1,146		1,332	8,440	6,336
AVE: (9)	77	525		43	254		6	31		22	127		148	938	6,198
BLUE FIN *	66	164		14	35		27	67		8	20		115	286	2,487
LAURENTIAN **	208	915		0	0		0	0		7	31		215	946	4,400
BARNES	78	126		0	0		7	11		25	40		110	176	1,600
CALANUS *	36	103		25	71		80	229		5	14		138	414	3,000
URRACA	15	68		0	0		0	0		94	491		109	559	5,128
< CLASS IV TOTAL	403	1,375		39	106		114	307		139	596		695	2,384	3,430
AVE: (5)	81	275		8	21		23	61		28	119		137	476	3,466
Fleet Total	2,655	26,466		1,138	16,225		472	4,566		642	5,049		4,907	52,306	10,661
AVE: (28)															

YEAR:	2,000													
As of:9/13/99														
		NSF			NAVY			NOAA			OTHER			TOTAL	DAILY
SHIP/CLASS	DAY	$		DAY	$		DAY	$		DAY	$		DAY	$	RATE
R. REVELLE	206	3,399		107	1,766		0	0		0	0		313	5,165	16,502
MELVILLE	248	4,092		0	0		11	182		4	66		263	4,340	16,502
KNORR	265	4,346		57	935		0	0					322	5,281	16,401
ATLANTIS	262	4,506		0	0		19	327		22	378		303	5,211	17,198
EWING	253	4,174		0	0		0	0		7	116		260	4,290	16,500
T.G. THOMPSON (revised	81	1,375		70	1,188		10	170		94	1,595		255	4,328	16,973
CLASS I/II	1,315	21,892		234	3,889		40	679		127	2,155		1,716	28,615	16,676
AVE: (6)	219	3,649		39	648		7	113		25	431		286	4,769	16,679
EDWIN LINK	53	482		72	655		0	0		45	410		170	1,547	9,100
ENDEAVOR	98	1,009		85	876		26	268		20	206		229	2,359	10,301
OCEANUS	110	1,232		91	1,019		6	67		5	56		212	2,374	11,198
GYRE **	10	90		55	495		0	0		81	729		146	1,314	9,000
NEW HORIZON	54	524		30	291		23	223		38	369		145	1,407	9,703
SEWARD JOHNSON	168	1,646		4	39		86	843		1	10		259	2,538	9,799
WECOMA (revised 9/13 jm	140	1,523		21	228		39	424		0	0		200	2,176	10,880
CLASS III	633	6,506		358	3,603		180	1,825		190	1,780		1,361	13,715	10,077
AVE: (7)	90			21	515		26	261		27	254		194	1,959	9,997
PELICAN (revised 9/13 jmp	80	300		81	304		50	188		29	109		240	901	3,754
LONGHORN (revised 9/13 j	20	80		30	120		0	0		28	112		78	312	4,000
POINT SUR (revised 9/13 j	42	294		56	392		0	0		69	483		167	1,169	7,000
CAPE HATTERAS	103	812		47	371		31	245		16	126		197	1,554	7,888
ALPHA HELIX	95	951		0	0		21	210		30	300		146	1,461	10,007
R. SPROUL	49	299		33	201		0	0		27	165		109	665	6,101
CAPE HENLOPEN	147	821		37	207		0	0		4	22		188	1,050	3,906
WEATHERBIRD II (revised	130	1,082		0	0		0	0		0	0		130	1,082	8,320
SEA DIVER	26	125		62	298		0	0		0	0		88	423	4,807
CLASS IV - TOTAL	692	4,764		346	1,893		102	643		203	1,317		1,343	8,617	6,416
AVE: (9)	77	529		38	210		11	71		23	146		149	957	6,198
BLUE FIN	79	208		8	21		25	66		5	13		117	308	2,632
LAURENTIAN	232	1,044		0	0		0	0		0	0		232	1,044	4,500
BARNES	36	74		5	10		10	21		39	81		90	186	2,067
CALANUS	45	292		61	397		61	397		6	39		173	1,125	6,503
URRACA **	15	79		0	0		0	0		93	477		108	556	5,148
BLUE HERON	65	254		0	0		14	55		27	105		106	414	3,906
< CLASS IV TOTAL	472	1,951		74	428		110	539		170	715		826	3,633	4,398
AVE: (5)	79	339		15	86		19	97		29	122		144	644	4,471
Fleet Total	3,112	35113		1,012	9,814		432	3685.75		690	5,967		5,246	54,580	10,404


Ship Costs 1999 vs 2000
60,000
50,000
40,000
30,000
20,000
10,000
0
Cost of Shiptime
NSF
NAVY
NOAA
OTHER
TOTAL
Funding Agency
1999
2000

NAVO CY2000 PROJECTED UNOLS REQUIREMENTS

AT 3.0 MILLION

	Funding $ = (000K)
Process	200
Acoustics	175
Services	175
Equip Lease	120
NAVO	150
	820

PRIORITIZED	Scheduled on	Ship Days	
So. FLA Range	Calanus	20	
GOMEX (Carron)	Pelican	60	
ONSLOW	Hatteras	30	
SOCAL RANGE	New Horizon	30	
MIW WGOMEX	Longhorn	30	
NARRAG	Endeavor	10	
		180	2160

Total Estimated Costs	2980

AT 7.5 MILLION

	Funding
Process	300
Acoustics	175
Services	300
Equip Lease	120
NAVO	300
	1195

Priority #	PRIORITIZED	Scheduled On	Ship Days	
1	So. FLA Range	Calanus	20	
2	GOMEX (Carron)	Pelican	60	
3	ONSLOW	Hatteras	30	
4	SOCAL RANGE	New Horizon	30	
5	MIW WGOMEX	Longhorn	30	
6	NARRAG	Endeavor (10 days)	15	
				2220
7	CAPE COD	Endeavor	15	
8	CENCAL P.O.	New Horizon	15	
9	MIDLANT P.O.	NOT SCHEDULED	20	
10	SoCal P.O.	New Horizon	15	
11	Pac NW P.O.	NOT SCHEDULED	15	
12	KEYWEST	Calanus	20	
13	SUBPAC (Hawaii)	Thompson (50 days	60	
14	PUERTO RICO	NOT SCHEDULED	30	
15	TEX A&M	NOT SCHEDULED	60	
			265	4050

Total Estimated Costs	7465

Appendix IV

UNOLS Council Meeting
September 1999

Academic Research Fleet Review

Council issues and input

The goal of any research facility should be to find the optimum path to satisfy the needs of the research enterprise. In this context, for support of oceanography, this may require going outside the present UNOLS fleet for specific capabilities. We believe a case can be made to include some commercial charter operations that meet UNOLS standards as part of UNOLS operations, to provide capabilities unavailable within the UNOLS fleet. We note that in special circumstances, the federal funding agencies already go outside the UNOLS system for specialized capabilities; we recommend here that this might be better done inside the UNOLS system. We do not recommend "bare-boat" chartering due to complex issues of safety, mobilization and technical support. We expect the use of commercial vessels to be only a small fraction of total usage, but expanding UNOLS' scope in this manner would have at least two important advantages: greater ability and flexibility to meet science needs, and outside benchmarks.

We ask NSF to consider a trial which includes some commercial operators participating as UNOLS non-member operators to provide unique capabilities not otherwise available.

Common issues (cont.)

The reliability of shared-use shipboard systems emerged as a major concern through the review of fleet responses, discussions with UNOLS operators, and NSF management. The committee feels that NSF and UNOLS should examine equipment issues to see if a list of shared-use equipment for each vessel and class can be identified and a quality-based system adopted fleet-wide to ensure that this equipment gets proper logistical and technical support at each operating institution. As merit-reviewed science programs progress, they introduce new instrumentation and facility support requirements to the Academic Research Fleet. New physical, chemical, geophysical, optical and biological sensors all collect data at rates and densities which challenge the capacity of existing shipboard computer systems. AUVs and ROVs extend the reach and efficiency of shipboard systems. Improvements are needed in the strategies and practices of planning and managing "common" shipboard equipment. Owners and operators, working through UNOLS and in conjunction with NSF and other federal agencies, should develop policies and practices for managing shared-use, technical support in the Academic Research Fleet.

There is a need for a strong, continued program of new technology introduction; steady improvement of existing facilities and technologies; greater, continuing attention to quality control and safety; and a more systematic, standard approach to maintenance, renovation, upgrading and replacement.

The funding agencies and UNOLS need to support fleet improvements by enhancing quality control, expanding training of personnel in technical and safety procedures, and developing even higher standards for shared-use facilities.

Council issues (cont.)

A frequent comment made by those responding to the NSF informal survey was that they strongly supported the current system of shipboard ship operations to oceanographic institutions. Nonetheless, a number of issues were raised, particularly from those users further removed from the operating institutions, and these need to be addressed. First is the question of accountability. What recourse does a scientist have when a ship, equipment, or its technical staff fails to deliver the level of service necessary to meet the scientific objectives of the cruise? While major incidents of this sort are apparently rare, there was clear indication of minor situations that have led to frustration on the part of the users. Second, some users were dismayed at the lack of consistency of the shared-use equipment and technical capabilities available across the fleet. The Committee discussed the possible fleet-wide adoption of modern quality control efforts, including increased education and training of personnel and rigorous evaluations. The Committee feels that NSF should support this program and evaluate operator performance regularly as part of the quality program. UNOLS appears to be a well-suited vehicle to institute and evaluate such an effort in conjunction with the federal agencies.

NSF should continue the practice of periodically competing the management of the UNOLS office, and should consider funding it by a cooperative agreement rather than a grant to ensure necessary management oversight.

NSF-UNOLS Office Cooperative Agreement

Cooperative agreements (general)

Cooperative agreements are used by NSF when accomplishment of the project objectives requires substantial technical or management involvement. This may be necessary when an activity is technically or managerially complex, requires coordination with other federally supported work, or to assure suitability or acceptability of certain aspects of the activity (management oversight).

NSF does not assume overall control of a project, or unilaterally change or direct the project activities. NSF may provide management guidance and require approval of specific decisions, milestones, procedures or sub-awards. All agreements must state the nature and extent of expected NSF involvement to ensure that the responsibilities for each party are understood.

(excerpted and abridged from NSF Proposal and Award Manual)

NSF-UNOLS Office Cooperative Agreement

UNOLS functions:

Ongoing

- scheduling procedures
- safety standards
- services
- risk management
- cruise reports and statistics

New emphasis

- cruise assessments
- user support and technology improvements
- evaluation of operator performance
- continuous quality improvement

UNOLS Operator Inst. functions:

Ongoing

- ship operations
- instrumentation and technical

New emphasis

- management and training
- continuous quality improvement
- performance reporting

NSF and other federal sponsors view agency involvement in management objectives and implementation plans as required.

Appendix V

Fleet Improvement Committee
Report to UNOLS
September 1999

1. Addition of new members

FIC is adding two new members: Dr. David Hebert from URI is joining FIC representing physical oceanography. Dr. Mark Brzezinski's from UCSB representing geochemistry. Both fill appropriate regional and disciplinary niches. With those additions the membership stands at:

UNOLS Operators:
Bill Smethie, LDEO.
Tom Weingartner, U. Alaska.
Chris Measures, U.Hawaii
David Hebert, URI

Any Non-Op Institution:
Larry Atkinson, ODU.
Mark Brzezinski, UCSB.

Any UNOLS Inst:
Ex-Officio: Joe Coburn (WHOI)
John Freitag (URI)

2. Oversight of AGOR 26 – the "Hawaii Swath"

FIC has participated in several meetings over the past several years on issues related to AGOR-26. At the upcoming November FIC meeting we will again hear a report from NavSea and Lockheed-Martin regarding the progress. At that time, as in the past, we may assign a subgroup to address a specific problem that comes up.

3. The Alaska SMR

This SMR is now in the hands of the University of Alaska. FIC will provide support as necessary.

4. The East Coast SMR

This SMR is tabled for the time being until a clearer direction appears. The SMR is essentially complete at the level of detail agreed upon at the beginning of the effort.

5. Cape Henlopen replacement

I have had discussions with Mat Hawkins at U. Del regarding FIC involvement in the long range planning for the Henlopen replacement.

6. Biennial Review

The review is slowly taking up speed. We are at the point of getting commitments from authors. Following is the brief outline of the review.

Topic	Author
The Future	
Future Research Requirements	Chairs of NSF Ocean Discipline review Comn
Future Observing Systems	
General Information on the UNOLS Fleet	
State of the Fleet and Trends in Fleet Use	Atkinson, DeSilva, Bash, and Prince
Historical Perspective of Fleet Replacement and Expansion	Dick Pittinger and others including past chairs
New Assets	Chris Measures (9/10/99)
Trends in support of research sponsorship	
Specific Topics - New types of vessels	
Icebreakers	Jim Swift
Seismic Vessels	Paul Ljunggren and John Diebold
Swath Vessels	Joe Coburn
ROV's and AUV's	Fred Grassle, Bellingham
Ocean Observatories	Bob Molinari
Fisheries and Hydrographic Surveying	
Fisheries Surveys	Ned Cokelet
Hydrographic Surveys	Sam DeBow
Technical Issues	
New Regulations	Joe Coburn
Ship Supported Technology	

Larry Atkinson
Chair, FIC

Appendix VI

UNIVERSITY OF DELAWARE

THE GRADUATE COLLEGE OF MARINE STUDIES

OFFICE OF THE DEAN

Robinson Hall
University of Delaware
Newark, Delaware 19716-3501 U.S.A.
Ph: 302/831-2841
Fax: 302/831-4389
E-mail: ctgood@udel.edu

September 20, 1999

LETTER OF INTENT

Dr. Robert Knox
Chair, UNOLS Council
UNOLS Office
P.O. Box 392
Sauderstown, RI 02874

Dear Dr. Knox:

The Research Vessel *Cape Henlopen* will complete a two-year modernization program in early 2000. This overhaul will make necessary physical improvements, allowing her to better serve the scientific community into the future. Tentatively, the University of Delaware plans to retire the *Cape Henlopen* in 2008; she will be 31 years old.

The University is dedicated to remaining a ship operating institution. We intend to use this nine-year window to design and build a vessel to replace the *Cape Henlopen*. We will provide resources for preliminary design as well as a significant portion of the funds needed for follow-on design and construction. Financial support to cover remaining costs will be sought from various funding agencies.

To develop this regional asset, we will look to the mid-Atlantic scientific community this new vessel will serve for requirements and capabilities. We will work closely with the UNOLS Fleet Improvement Committee and incorporate the East Coast Scientific Mission Requirements they have developed.

The College of Marine Studies is excited about the challenges that lie ahead as we pull together current and future requirements to provide the science community with a world class research vessel for the Atlantic coast.

Sincerely,

Dr. Carolyn Thoroughgood
Dean, College of Marine Studies

cc: Larry Atkinson
Jack Bash

Appendix VII

MOORINGS AS FACILITIES:
Rationale for an Assessment of the Concept

UNOLS Council Working Group
D.A. Hansell, L. Atkinson, T. Lee, C. Reimers, T. Royer

Purpose: The primary UNOLS objective, as written in the UNOLS Charter, "*is to coordinate and review the utilization of facilities for academic oceanographic research, access to those facilities and the current match of facilities to the needs of the academic oceanographic programs.*" Given these charges, the UNOLS Council has formed a Working Group to evaluate the ocean research community's need for ocean moorings operated in a facility mode. The term "mooring" here is meant to include traditional arrays of instruments spaced between a surface buoy and bottom anchor as well as bottom-mounted observatories.

Goal: The Working Group seeks to identify the needs of that portion of the community requiring access to moorings for the conduct of research, instrument and sensor development and testing, etc., but who neither need nor desire to maintain moorings within their research programs. Operation of a mooring as a facility would be beneficial, for example, if it accelerated development or evaluation of ocean sensors required for evolving needs, such as broad scale ocean observing systems. The data streams produced in time series mode over the life of the mooring facility should be beneficial to interdisciplinary ocean research programs if the sites for operation are selected carefully.

Community Pressure: The need for developing and testing *in situ* instrumentation and sensors, as well as to conduct remote research, is increasing. A portion of the impetus for this work comes from the evolving ocean observing programs for climate and carbon; part from the research interests of individual scientists. There is increasing pressure from the ocean research community for access to moorings. Existing moorings that have attracted high user interest include those located at the sites of the US JGOFS time-series stations (BATS and HOT). The Bermuda Testbed Mooring (BTM) is a good example of a mooring that has become a "mooring of opportunity" for many scientists. This mooring work, led by Dr. Tommy Dickey and supported by NSF and ONR, has attracted numerous users from several institutions. The opportunity provided by the BTM for the advancement of many lines of research, in addition to it's own priorities, has been valuable. These opportunities need to be made available to the entire community of scientists at a few sites selected to meet the broadest needs of the community.

Analogy to the Deep Submergence Vehicle Facility: A mooring operated in facility mode would be analogous to the current arrangement for the deep submergence vehicles, with their ready availability to ocean scientists and cost transparency. These vessels operated for the U.S. academic community become available to scientists through the proposal system. The composition of the deep submergence fleet is, ideally, driven by the needs of the community. The vessels are maintained as facilities by institutional operators, with operating and

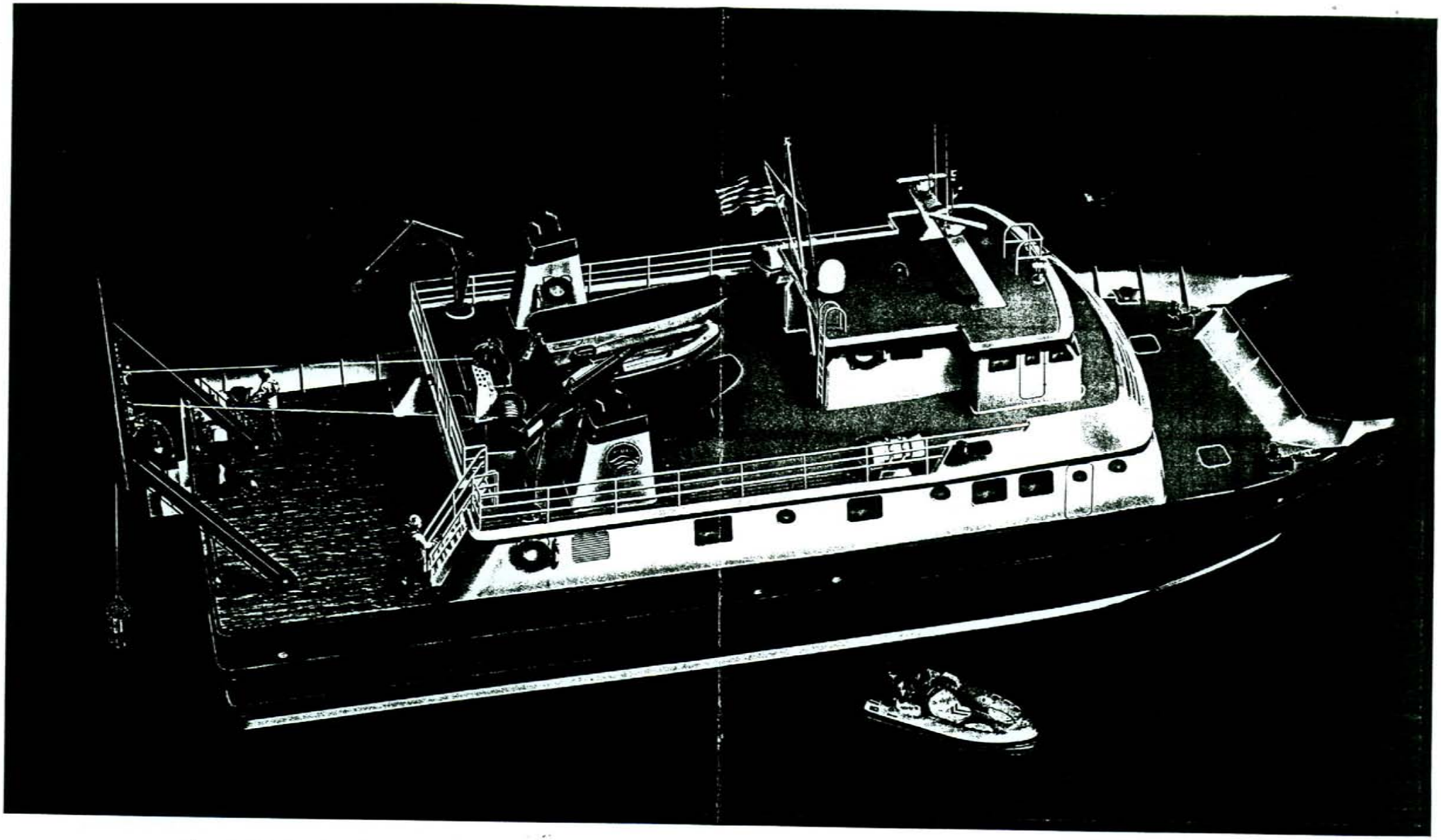
maintenance funds provided by the funding agency to the operators. The deep submergence facility is coordinated and overseen by UNOLS through DESSC, the Deep Submergence Science Committee. This very successful model makes the operation and maintenance of these vessels transparent to the users, thereby increasing the user's productivity and efficiency in the conduct of science. Such a model should be beneficial to members of the community who rely on moorings for their work.

Facility Design: A mooring facility could take many forms. However, it should be a cost effective design, suitable to the interdisciplinary needs of the broader community, and operated at one or more carefully chosen sites. The facility could comprise a set of relatively inexpensive moorings, available for quick deployment and turnaround, and deployed over a spatially relevant grid as demanded by individual projects. Alternatively, a larger, single mooring could serve as a facility. This latter model may result in a facility less responsive to the needs of individual scientists, with turnaround based on the needs of the many rather than the few. As is the case with common use underway sensors on the research vessels, the mooring facility might have a suite of sensors for commonly essential meteorological and hydrographic measurements, perhaps with real time transmission of data to the shore base of operation. These facility-supported sensors should meet the broadest needs of the users.

Concept Evaluation: A small workshop including mooring operators (such as T. Dickey, D. Frye, M. Abbot, B. Weller, T. Cowles, etc.) and mooring users (such as E. Sholkovitz, S. Emerson, E. Boyle, etc.) should be held to identify costs, suitable locations and the mechanisms of facility oversight and operation. A successful facility will meet the needs of the community of users; such should be the ultimate goal of the workshop.

Conclusion: An increasing role for moorings in oceanographic science has been predicted and discussed for several years. The rate-limiting step for this rise in research has been the relative inaccessibility of moorings to the broader community of ocean scientists. Operation of a mooring in facility mode will take the operational concerns out of the hands of the scientists, opening the way to increased scientific productivity and efficiency. The emerging demands of ocean science will be supported through such a facility. An assessment of the need, costs and operating profile must be made.

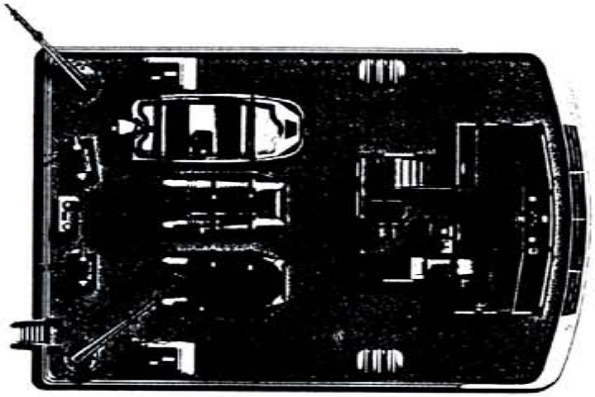
Appendix VIII

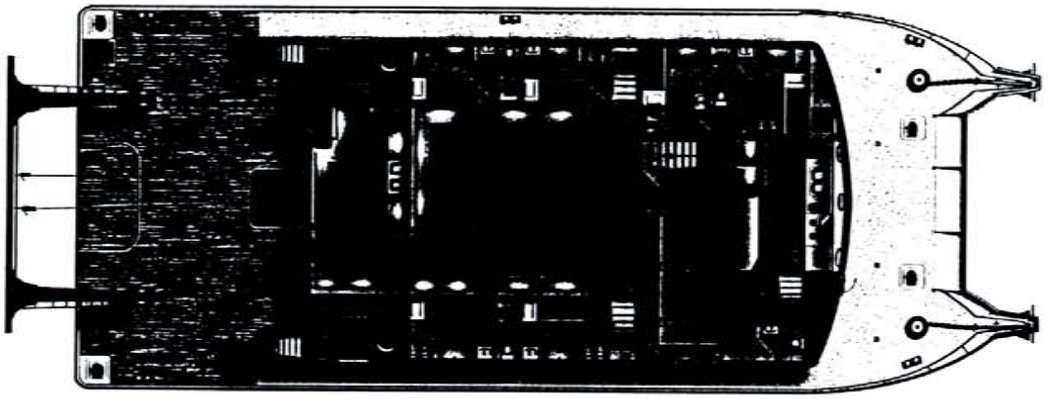


Rosenstiel School of Marine & Atmospheric Science
University of Miami
4600 Rickenbacker Causeway
Miami, Florida 33149
(305) 361-4000

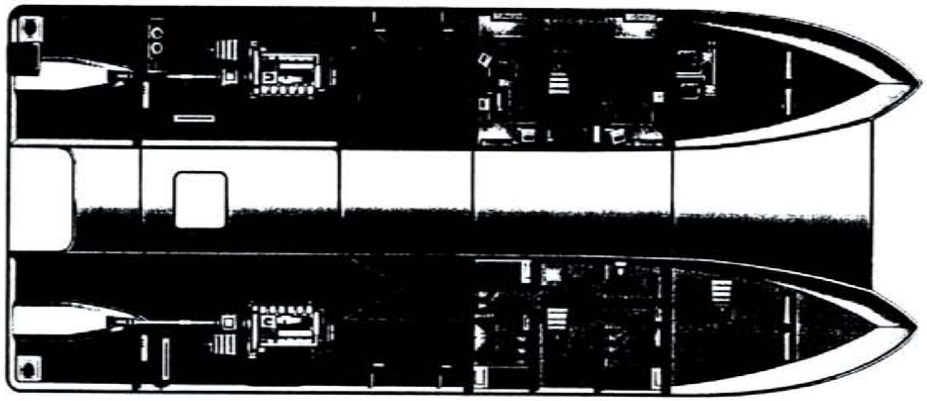
UNIVERSITY OF Miami
ROSENSTIEL SCHOOL

UPPER DECK
AND BRIDGE

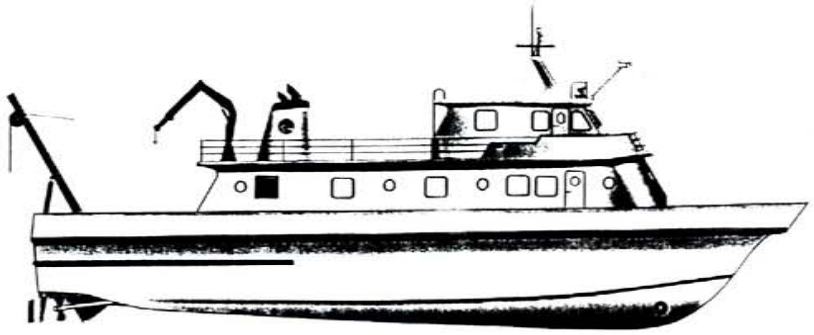




MAIN DECK



LOWER DECK



R/V Catamaran

Specifications

Length	96'
Breadth	40'
Draft	5' 6"
Gross Tonnage	<100
Propulsion	Twin Cummins QSK 19 760hp each
Propellers	Servogear Variable Pitch
Electrical	Twin 80kw generators 208 vac, 3 phase, 110/120 vac, single phase UPS in laboratories
Fresh water	3,000 gallons plus Reverse Osmosis water maker
Fuel	10,000 gallons
Complement	20 berths, 4 crew, 16 science party
Speed	12 knots

Vessel capabilities include the following:

-Dynamic positioning for precise station keeping using bow thrusters, controllable pitch propellers, and independent rudders and controlled by a Kongsberg Simrad DP system which is tied to a TSS P05/ MV 320 Position, Attitude, Heading, and Vertical Reference Sensor.

-A transducer suite that includes ADCP transducers for measuring ocean currents, a 7 x 3.5kHz transducer array for sub-bottom profiling, and a 12kHz transducer for deep water bathymetry.

-A moon pool between the hulls for drilling or coring operations.

-A notched stern to facilitate handling equipment into the water using the A-frame.

-An A-frame, a conductor wire winch, a hydro wire winch, two cranes on the after end of the 01 deck, space for vans, space for small boats, tie downs on both decks on 2 foot centers.

-Sea water flowing systems with pick ups at the bow and space in the wet lab for instrumentation that would typically include a thermosalinograph, a partial CO2 monitor, a nutrient monitor, fluorometers, and a dissolved oxygen monitor.

-Meteorological sensors include wind speed and direction, air temperature, relative humidity, barometric pressure, and solar radiation.

-Over-the-side systems include a Sea Bird CTD system with a fluorometer on a 12 bottle rosette.

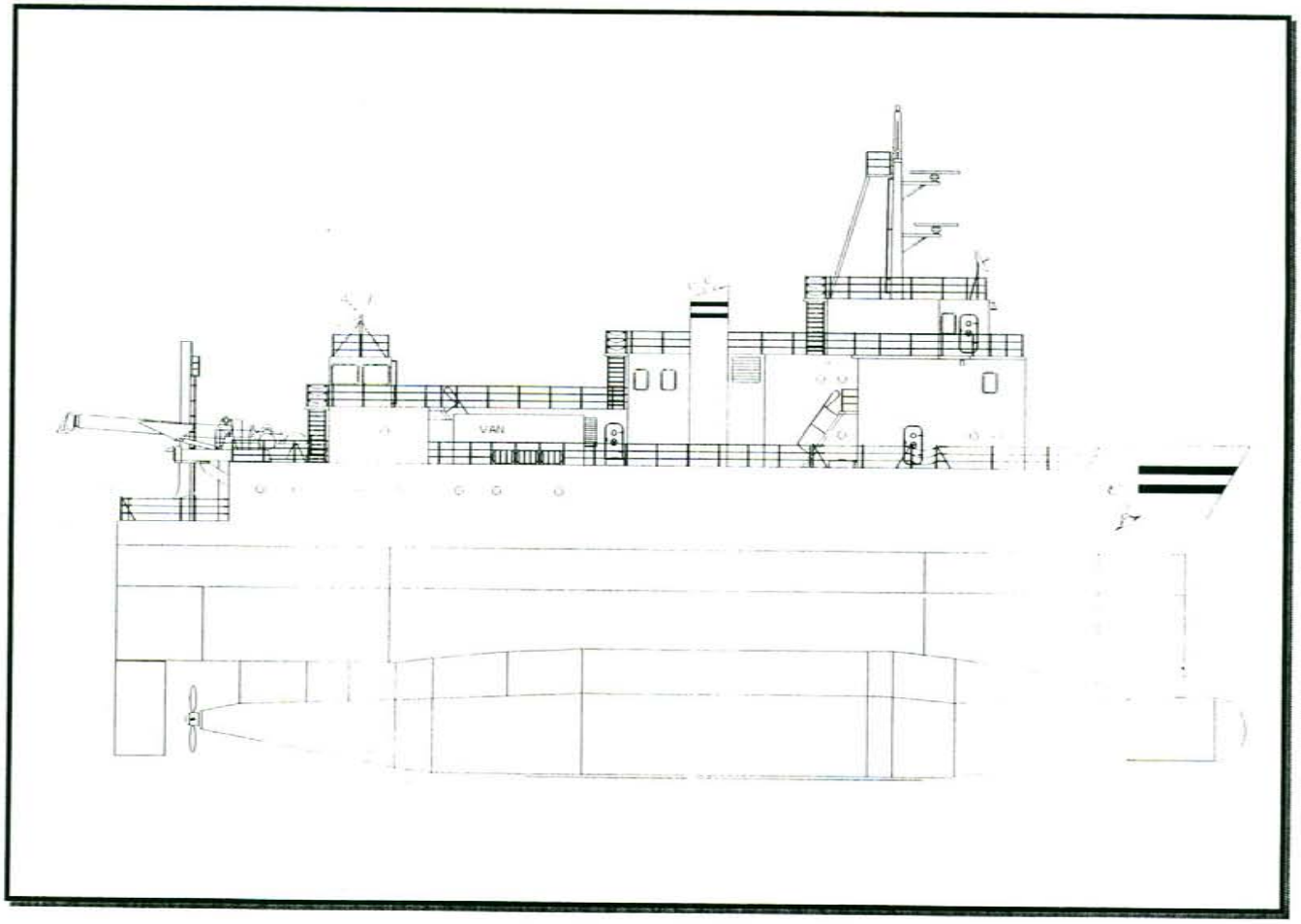
-A W. S. Ocean undulating system that allows continuous, underway vertical sampling through a pre-set section of the water column. It can be equipped with a variety of sensors.

-Vessel control stations are located in the bridge, on the 01 deck wings, and at the after control station on the 01 deck.

The vessel will be built to USCG Subchapter T specifications and will have an ABS International Load Line.

Appendix IX

AGOR 26 - SWATH OCEANOGRAPHIC RESEARCH SHIP



PRINCIPAL CHARACTERISTICS

Dimensions:

Length Overall	182 FT
Strut Length	172 FT
Lower Hull Length	171 FT
Beam	88 FT
Depth to 01 Level	50 FT
Draft at Load Line	25 FT

Displacement:

Full Load	2,500 LT
Lightship	1,961 LT

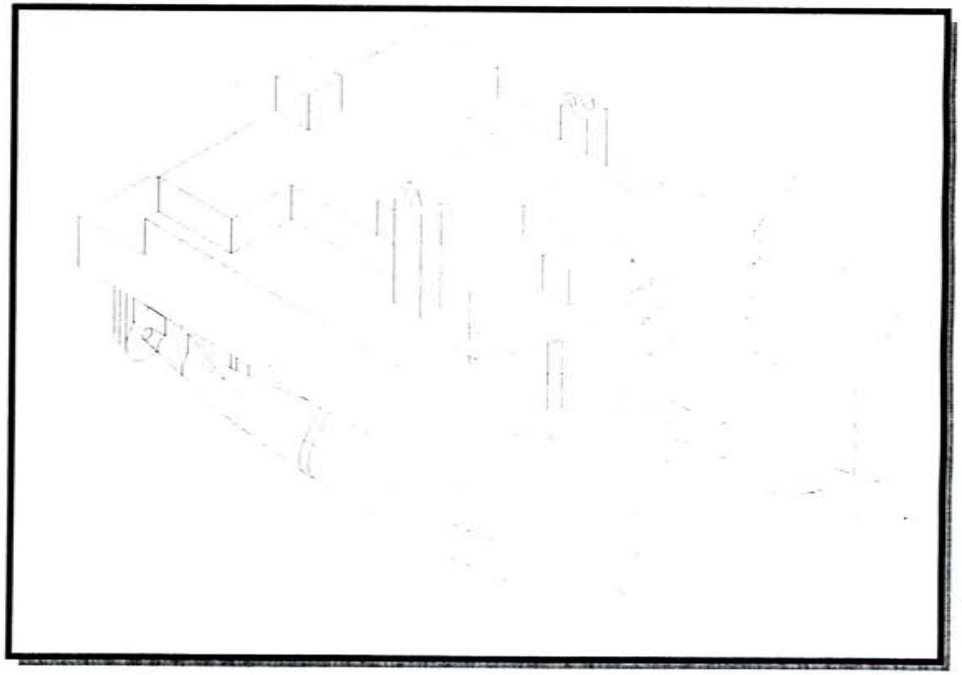
Performance:

Speed	15 Kts
Range	10,000 NM at 11 Kts
Endurance	50 Days

Certifications:

ABS	✠A1 circle E, ✠AMS, ✠ACCU UWILD (underwater inspection in lieu of drydocking) unrestricted service Ice Class D0
USCG	Oceanographic Research Vessel

Accommodations: 48 persons (17 crew)



OPERATIONAL CAPABILITIES

MISSION

GENERAL PURPOSE OCEANOGRAPHIC RESEARCH IN COASTAL AND DEEP OCEAN AREAS:

- SAMPLING AND DATA COLLECTION OF SURFACE, MIDWATER, AND SEA FLOOR PARAMETERS
- LAUNCH, TOWING, AND RECOVERY OF SCIENTIFIC PACKAGES; HANDLING, MONITORING, AND SERVICING OF ROVs, AUVs, DEEP SEA MOORINGS, AND BOATS
- SHIPBOARD DATA PROCESSING AND SAMPLE ANALYSES
- PRECISE NAVIGATION AND STATION KEEPING AND TRACK-LINE MANEUVERING TO SUPPORT DEEP SEA AND COASTAL OPERATIONS
- LONG PERIODS OF OPERATION AT LOW SPEEDS

PROPULSION

ENDURANCE	50 DAYS
RANGE	10,000 NAUTICAL MILES
SEA KEEPING	OPERATIONAL AT 12 KTS IN SS6, 4 TO 6 METER WAVE HEIGHT; 28 TO 47 KNOT WIND. LAUNCH AND RECOVER SCIENTIFIC EQUIPMENT IN A SS6 AT BEST HEADING.
STATION KEEPING	+/- 50 METERS IN SS6 AT BEST HEADING
TOWING CAPABILITY	SCIENTIFIC PACKAGES UP TO 30,000 LBS INCLUDING 10,000 LBS AT 10 KTS AND 25,000 LBS AT 2.5 KTS
SHIP CONTROL	CONTINUOUS VARIABLE SPEED CONTROL BETWEEN 0 AND 14 KTS INTEGRATED BRIDGE SYSTEM

OPERATIONAL CAPABILITIES

HULL	
DESIGN	DESIGNED TO COMMERCIAL STANDARDS ABS CLASSED: ✠A1 CIRCLE E, ✠ AMS, ✠ ACCU UNRESTRICTED SERVICE; USCG CERTIFIED OCEANOGRAPHIC VESSEL
ICE STRENGTHENING	ICE CLASS D0
ELECTRICAL	
ELECTRICAL SYSTEM	INTEGRATED ELECTRIC SYSTEM IAW IEEE P45/D3.0
CLEAN POWER	SUPPORT SCIENTIFIC LOAD OF APPROXIMATELY 100 KW; INCLUDING 12 KW UPS
MISSION	
WORKING DECK	2,000 SQFT
VAN SITES	(2) 20FT x 8FT ISO VANS
LABORATORY AREA	3,000 SQFT
SCIENTIFIC STORAGE	15,000 CUBIC FEET
OVER THE STERN HANDLING	CARRY, LAUNCH, AND RECOVER EQUIPMENT OVER THE STER
DECK EQUIPMENT	SUITE OF MODERN CRANES, WINCHES, AND U-FRAME
SCIENCE PAYLOAD	100 TONS
VIDEO/AUDIO/DATA NETWORK	SCIENTIFIC INFORMATION SYSTEM TO SUPPORT NETWORK OF COMPUTERS, SCIENTIFIC INSTRUMENTS, AND AUDIO-VISUAL MONITORS

OPERATIONAL CAPABILITIES

ACOUSTIC CHARACTERISTICS	
SHIPBOARD SYSTEMS	DESIGNED FOR NON-INTERFERENCE WITH SHIPBOARD SCIENTIFIC SUPPORT ACOUSTIC SYSTEMS. HULL, PROPULSORS, AND MACHINERY DESIGNED FOR REDUCED TRANSMISSION OF NOISE INTO WATER
SHIPBOARD SONAR SYSTEMS	1 DEG x 2 DEG MULTIBEAM SONAR SYSTEM, 95 kHz SHALLOW WATER MULTIBEAM SYSTEM, ECHOSOUNDER, SUBBOTTOM PROFILER, ACOUSTIC POSITION INDICATOR SYSTEM, ACOUSTIC DOPPLER CURRENT PROFILING SYSTEM. SONARS DESIGNED TO OPERATE AT SHIPS SPEEDS UP TO 12 KTS IN SS6
AIRBORNE NOISE	AS RECOMMENDED BY THE INTERNATIONAL MARITIME ORGANIZATION
ELECTRONICS	
NAVIGATION AND POSITIONING	DYNAMIC POSITIONING SYSTEM, DIFFERENTIAL GPS, AUTOMATIC RADIO DETECTION FINDER, SHIP'S DEPTH FINDING SYSTEM, INERTIAL REFERENCE SYSTEM, 10-CM AND 3-CM RADARS
COMMUNICATIONS	RELIABLE VOICE CHANNELS FOR CONTINUOUS COMMUNICATION
HABITABILITY	
ACCOMMODATIONS	48 PERSON COMPLEMENT
TEMPERATURE AND HUMIDITY	DESIGNED FOR FULL OCEAN SERVICE
LOGISTICS	SUPPORTED THROUGH COMMERCIAL RESOURCES

MISSION EQUIPMENT

SONAR SUITE

Multibeam Sonar (Including subbottom capability)	Simrad EM120, Or Equal
Shallow Water Multibeam System	Simrad EM 1002 (95 Khz) Or Equal
Echosounder	Simrad EA 500 Or Equal
SSBL & LBL Positioning System	Simrad HPR 418 Or Equal
Acoustic Doppler Current Profiling System	Sontex 125, Or Equal

HANDLING EQUIPMENT

(2) Telescoping Boom Cranes rated for lifting 20,000 lbs at a 30-foot radius and at least 5,000 lbs at a 40-foot radius. One crane located in the Working Deck area and the other port for towing over the side.

(1) Portable Deck Crane of the foldable boom and double telescopic type, HIAB FOCO Model 180 Sea Crane, or equal. Hydraulic extension of 46 feet 6 inches.

(1) Hydrographic Winch, Markey Machinery Company, type DESH-5 (electric), or equal provided for conducting oceanographic operations over-the-stern. EM cable from the winch drum will be led to the hydroboom. Winch located adjacent to the hydroboom.

(1) Traction Winch, Dynacon, or equal and one stowage winch will be provided and installed with appropriate cable runs to lead cables to the U-frame and the port crane.

(1) Hydraulically Actuated Stern U-frame provided on the transom to launch and recover oceanographic equipment and support running wire or cable from the traction winch. U-frame designed to handle 20,000 lbs and reach 12-feet beyond the transom.

USCG approved **Work/Rescue Boat**

SHIP SYSTEMS

PROPULSION EQUIPMENT

(4) 910 kW diesel generators sets driven by Caterpillar 3508b SCAC, Cummins-Wartsilla 8l170, or equal diesel engines

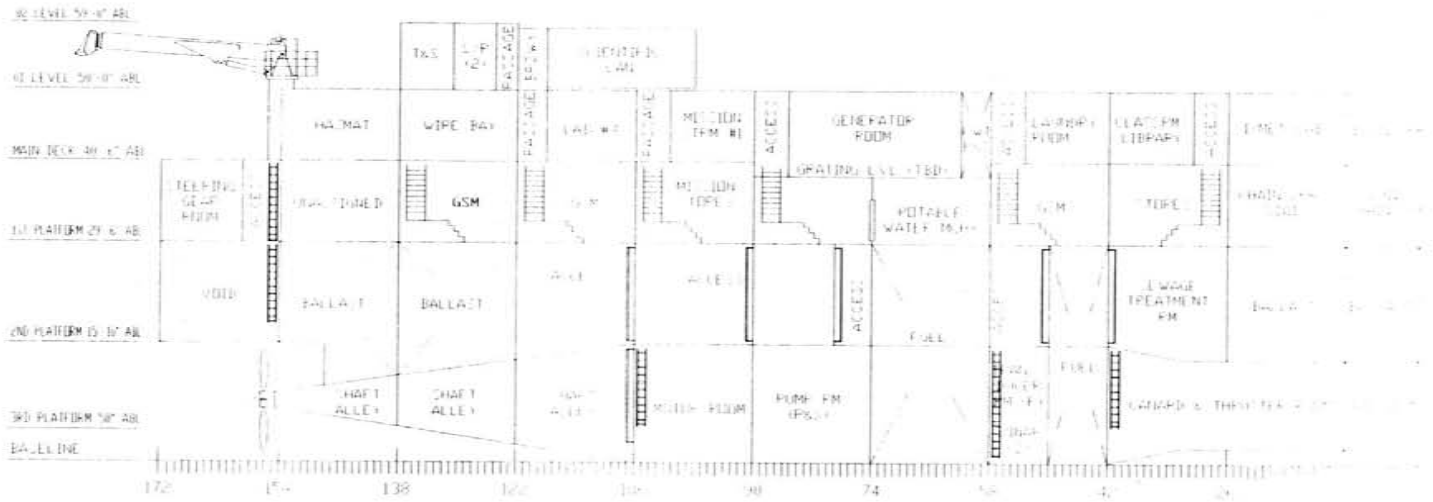
(2) DC main propulsion motors and drives

Norcontrol Data Chief 2000 Power Management System, or equal

NAVIGATION EQUIPMENT

Integrated Bridge	Simrad Vessel Control System (VCS), or equal
Inertial Reference Unit	TSS, Inc. Model POS/MV 320, or equal
Gyro Compass	Sperry MD 37, or equal
Differential GPS	Model TBD
Dynamic Positioning System	Simrad SDP01, or equal
(2) Surface Search Radars	10-cm and 3-cm
GMDSS	Model TBD
Wind Speed/Direction System	Japanese Radio Corporation Model ILD-20 or Simrad-Taiyo Model TD-A202b, or equal

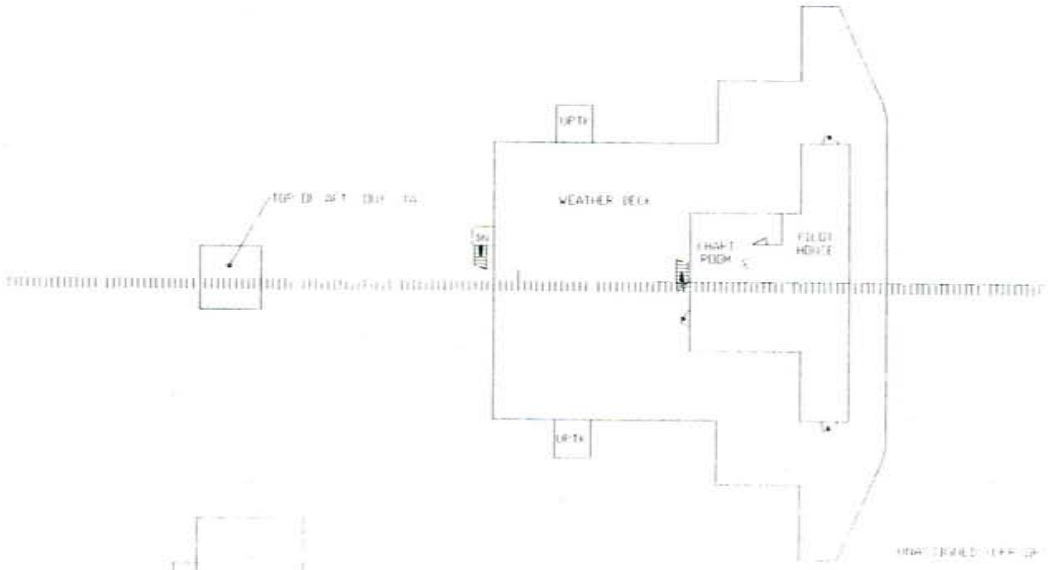
ELEVATION



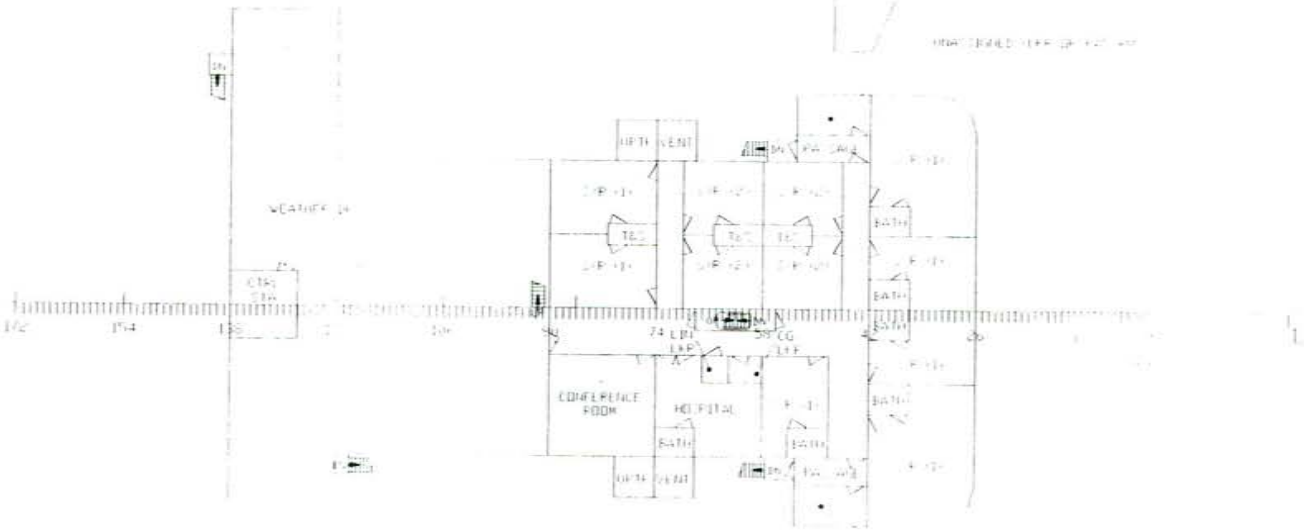
32' OFF CENTERLINE
PORT LOOKING OUTBOARD

03/02 LEVELS

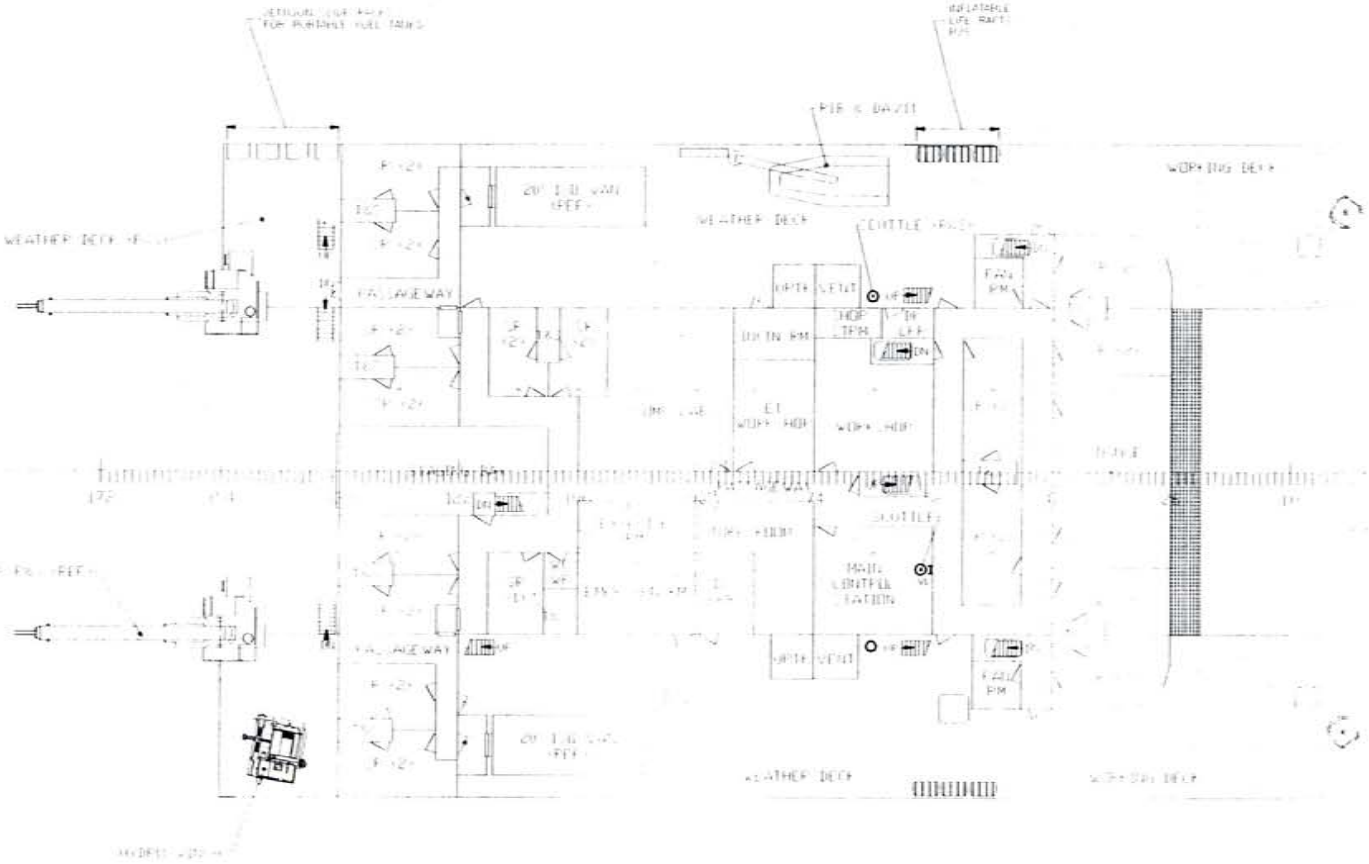
68 ft from BL



59 ft from BL

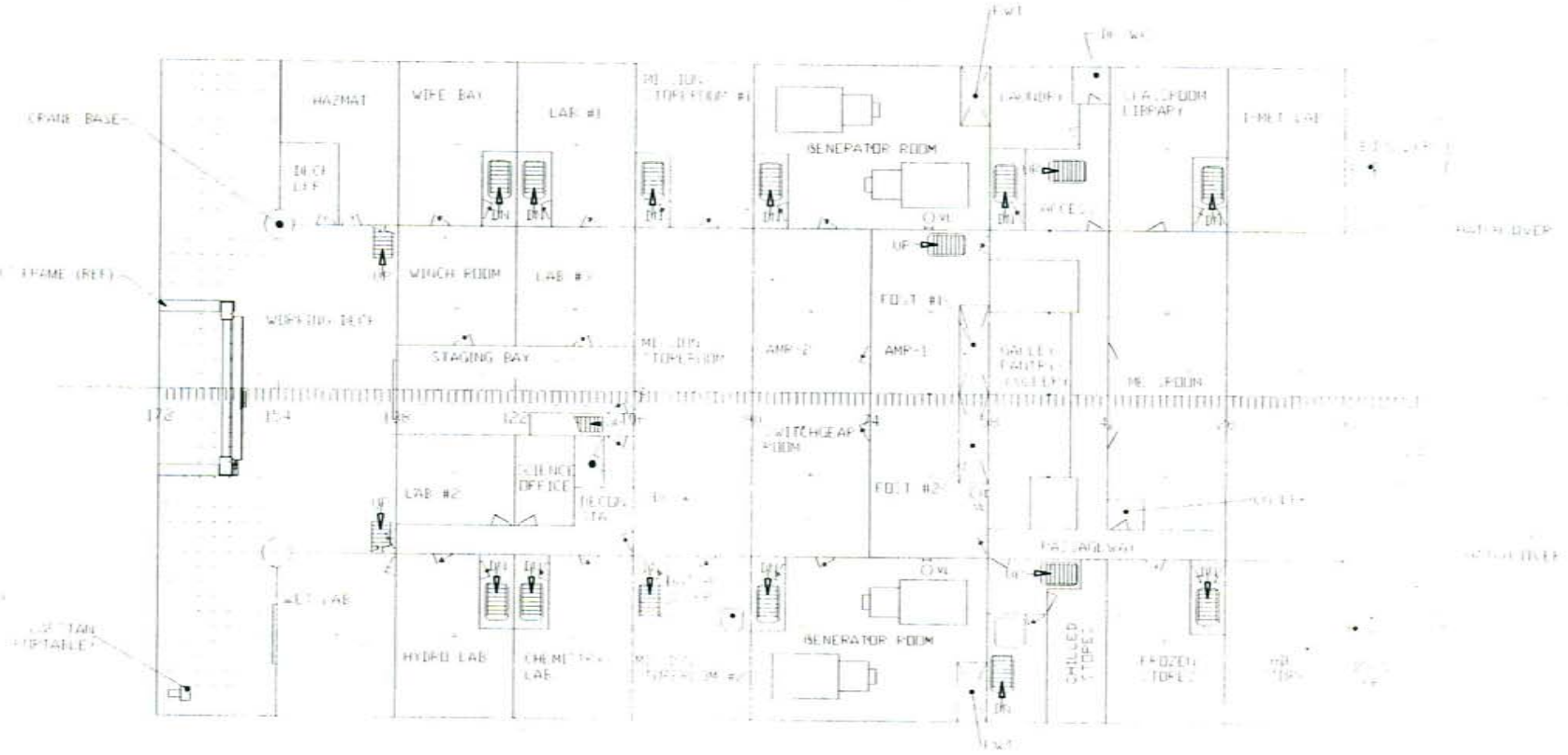


01 LEVEL



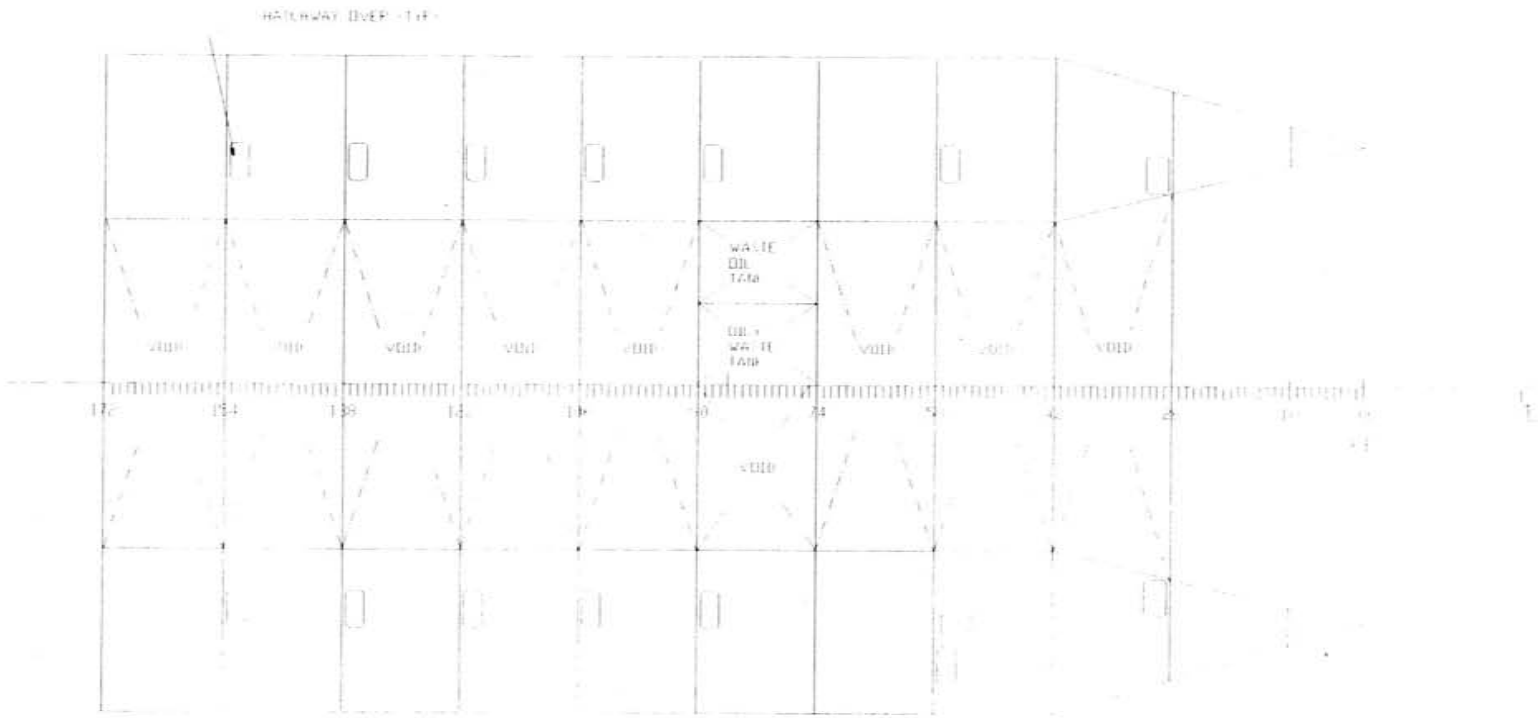
50 ft from BL

MAIN DECK



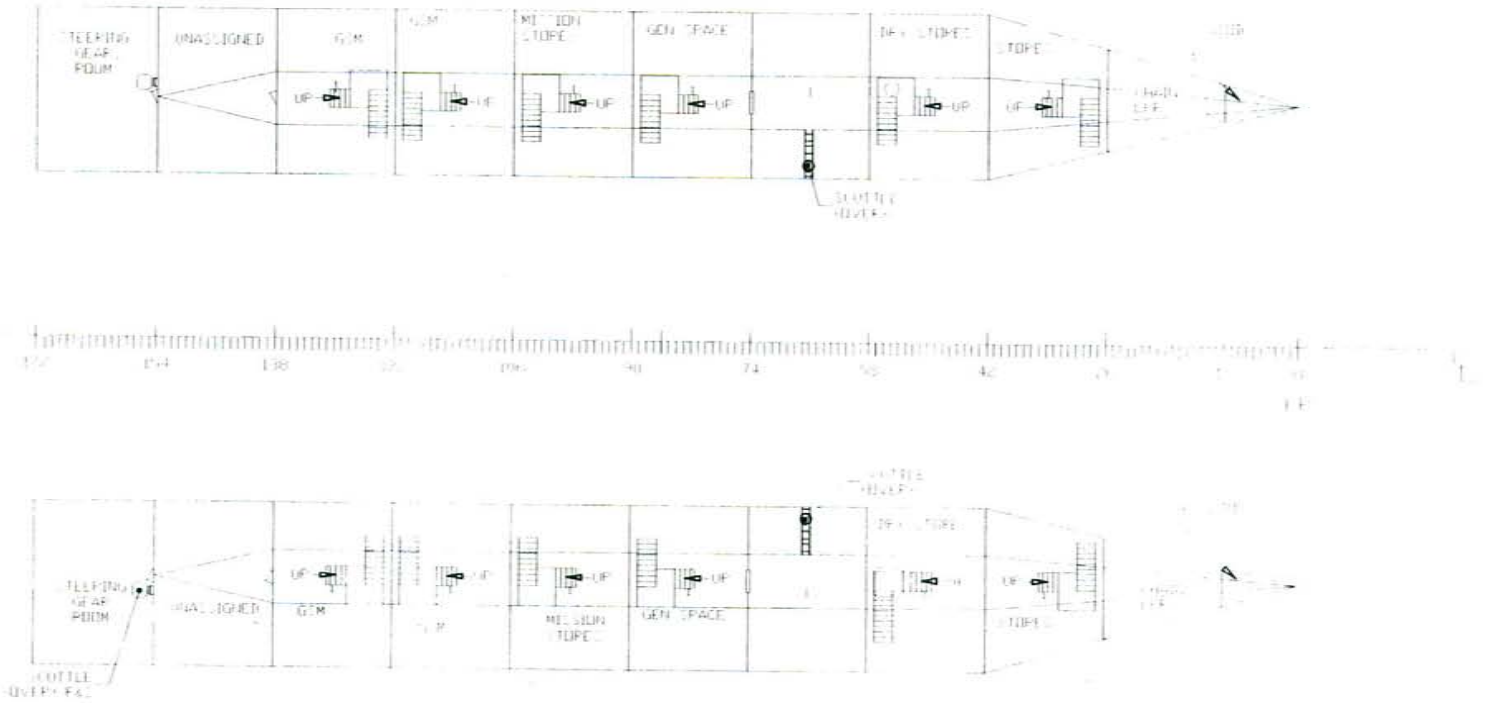
40.5 ft from BL

WET DECK



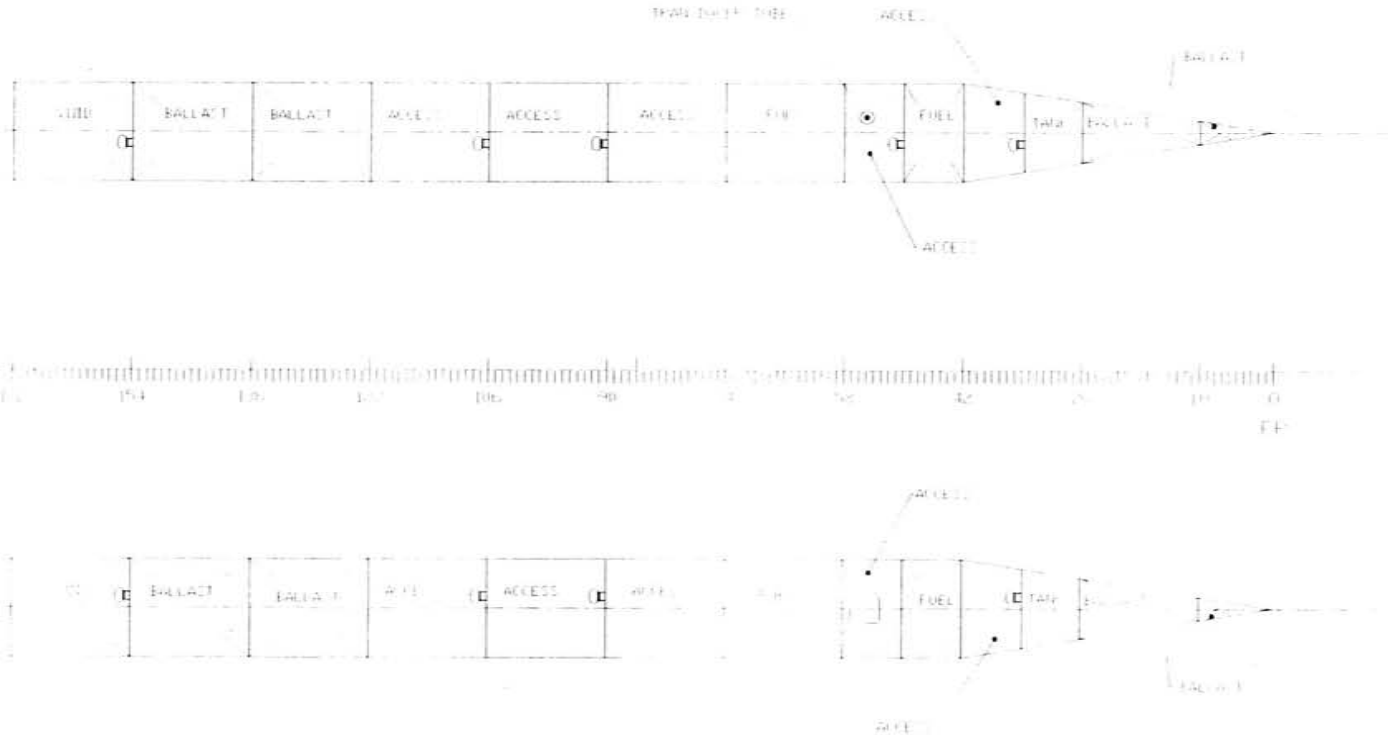
36.5 ft from BL

1ST PLATFORM



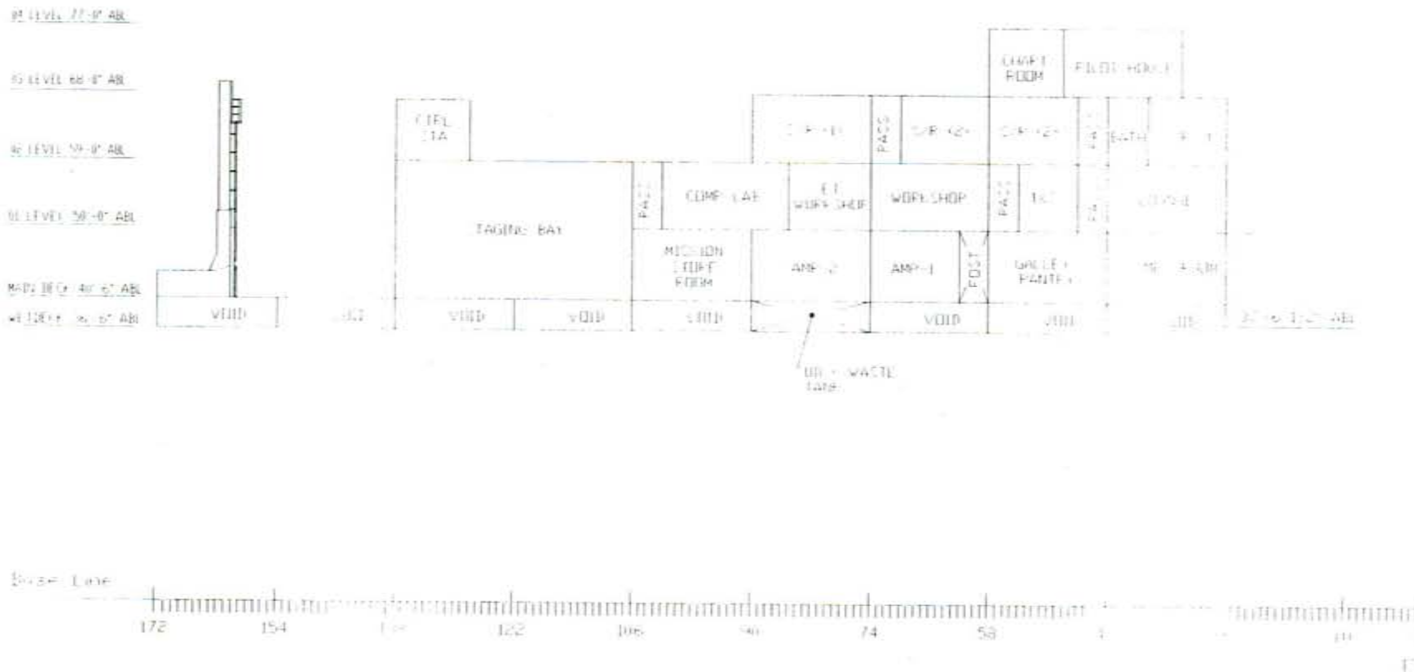
29.5 ft from BL

2ND PLATFORM

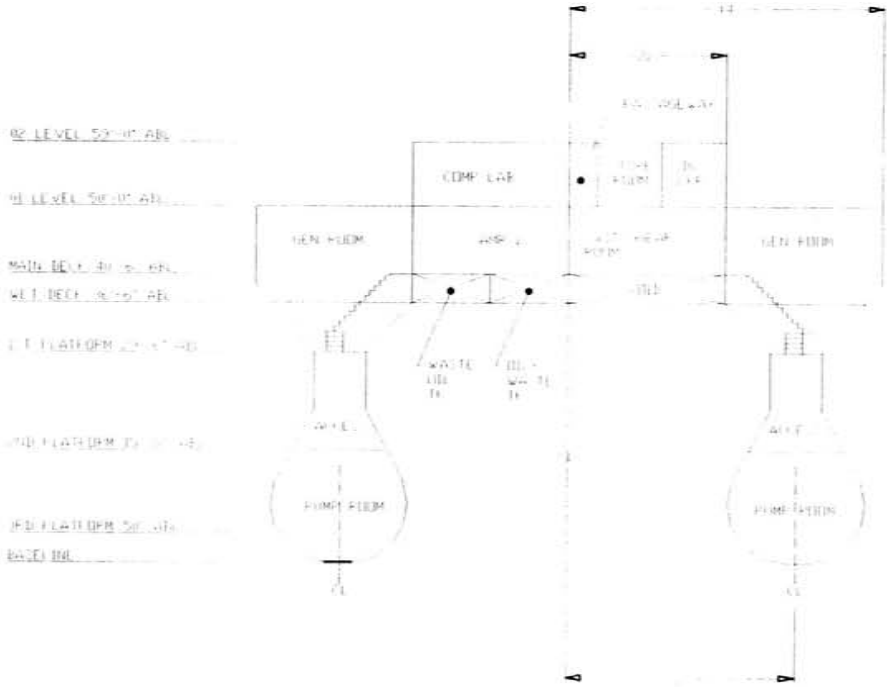


15.8 ft from BL

INBOARD PROFILE

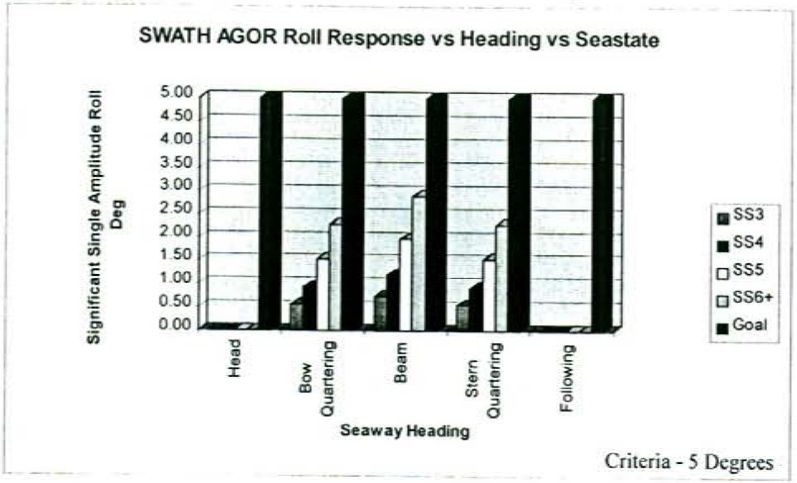


MID-SECTION VIEW (BHD 90)



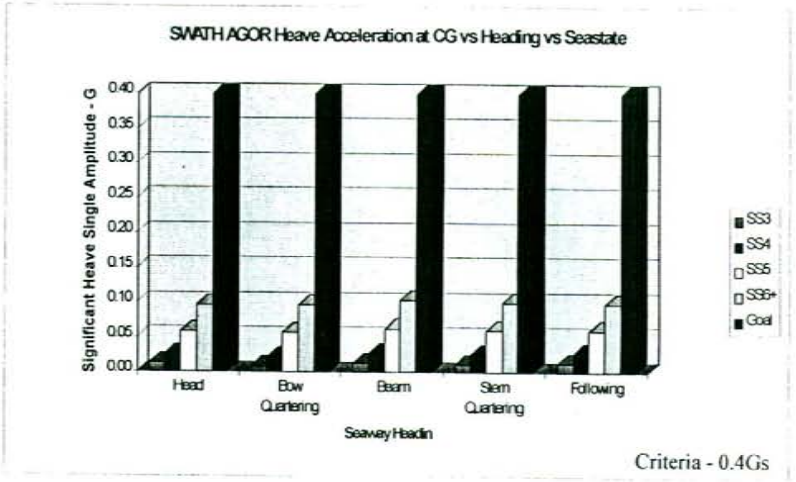
SEAKEEPING

Roll Response



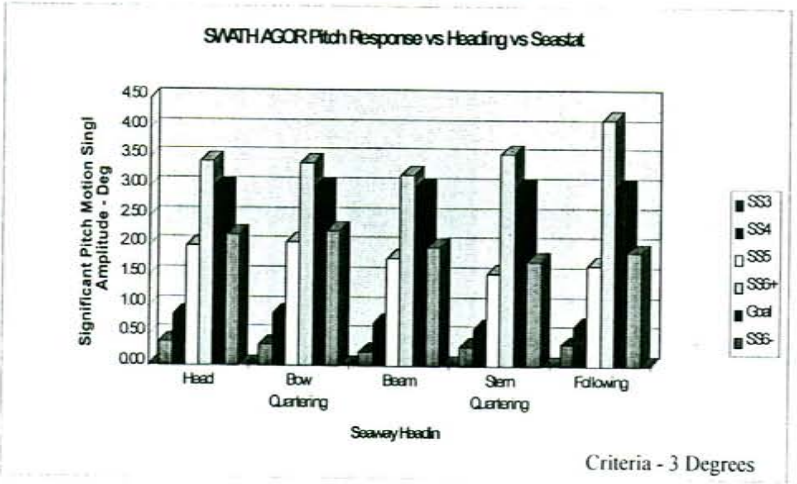
Criteria - 5 Degrees

Heave Acceleration - G's



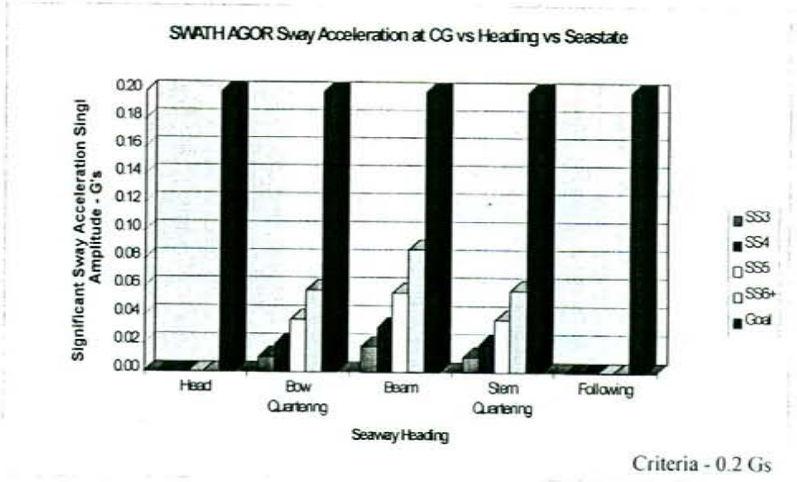
Criteria - 0.4Gs

Pitch Response



Criteria - 3 Degrees

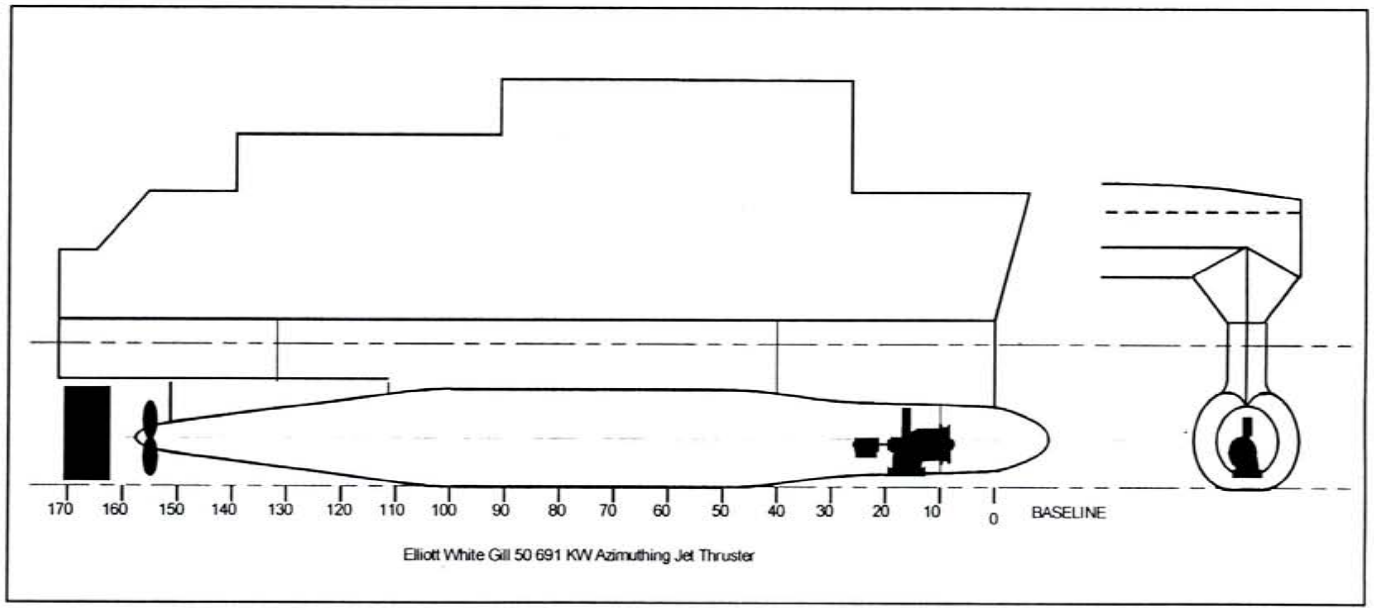
Sway Acceleration at CG



Criteria - 0.2 Gs

PROPELLER/THRUSTER COMBINATION

PROPULSION DRIVE	ELECTRIC OF COMBINED 3 MEGAWATT CAPACITY
FIXED PITCH PROPELLERS	11 FT DIAMETER, 150 RPM WITH 5 HIGHLY SKEWED BLADES
RUDDERS	LOCATED AFT OF PROPELLERS OF 100 SQFT EACH
AZIMUTHING BOW THRUSTER IN PORT HULL	15,000 LB STATIC THRUST W/ ELECTRIC DRIVE



Elliott White Gill 50 691 KW Azimuthing Jet Thruster