

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

**UNOLS
FLEET IMPROVEMENT
COMMITTEE**

**Meeting
Summary Report**

March 21-22, 2000

**United States Coast Guard Icebreaker, HEALY
Chesapeake Bay**



UNOLS Fleet Improvement Committee Meeting
March 21-22, 2000
United States Coast Guard Icebreaker, USCGC HEALY
Chesapeake Bay: Norfolk, VA underway to Baltimore, VA

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March 21, 2000

Welcome and Introduction - The UNOLS Fleet Improvement Committee (FIC) met at 0900 on March 21, 2000 in the conference room of USCGC HEALY while underway from Norfolk, VA to Baltimore, MD. Larry Atkinson, FIC chair, welcomed the committee and reviewed meeting logistics. Participants introduced themselves. The agenda, *Appendix I*, was reviewed and a new discussion item of ship inspections was added. Attendees are listed in *Appendix II*.

Discussion of Agenda Items and Future Fleet Planning - Larry charged the FIC to develop a plan for a FIC/UNOLS vision of the future based on the realities of:

- replacement/upgrade needs,
- Timelines, and
- Future science needs.

Larry reviewed the role of FIC (*Appendix III*) which is to periodically evaluate the state of the UNOLS fleet as well as science research directions to determine future facility needs. Next Larry presented a series of charts showing a variety of UNOLS vessel statistics and trends, see *Appendix IV*. The first chart demonstrated the length of time that can be involved with ship construction and upgrade. The next chart showed UNOLS fleet utilization for the past 20 years. The chart showed the number of ships available by year, as well as the differential between a Full Operating Year (FOY) and actual ship utilization. There was some discussion on the definition of the FOY. The RVOC's definition states the following: Class I/II=275 days, Class III = 250 days, Class IV = 180 days and Class V = 110 days. This definition differs from NSF's definition. Since it has been a number of years since these numbers were established, it was suggested that RVOC be asked to reevaluate the definition. Larry presented a chart showing the estimated cost of fleet replacement. This is based on a one-for-one replacement and indicated that by 2015, over \$500M would be needed to replace aging ships. A chart was

presented which compares the optimal ship days available by year with the average ship days required per year. The chart shows that by 2009 there will be a shortfall in the number of ships available to support the average annual ship day requirements. Lastly, a chart showing the estimated retirement dates of each ship was presented.

Report from UNOLS - Bob Knox, UNOLS Chair, gave a brief report reemphasizing that all FIC issues are important to the health and future of the fleet.

Agency Reports:

United States Coast Guard (USCG): Jon Berkson provided the report for the Coast Guard. HEALY was delivered on November 9, 1999 and went through an abbreviated fitting out period. Warm water trials were conducted in the Caribbean to test out the ship's science systems. The ship will depart Baltimore after the FIC meeting for Halifax where it will begin ice trials in the Davis Straits followed by science system testing. After trials, the ship will be formally commissioned in Seattle in late summer. Jon gave a summary of a report by Lisa Clough, Chief Scientist for the warm water tests. The report was very positive.

Some HEALY equipment will need additional testing including the 300KHz ADCP. The Bathy 2000 system has problems and will be replaced by a Knudsen system. Coring went well. Testing of the Science Data Network (SDN) continues in an attempt to achieve error free navigation.

POLAR STAR completed the 1999 Deep Freeze operations in the Antarctica. The ship is now underway to the Arctic. POLAR SEA conducted Operation Deep Freeze in 1998 and is currently in a shipyard period in Seattle. They hope to have the ship available for a Science of Opportunity (SOO) cruise in late June.

National Oceanic and Atmospheric Administration (NOAA)- No report. The FIC expressed their interest in the new NOAA fisheries vessel.

Office of Naval Research (ONR) - Sujata reported that MOANA WAVE would be formally transferred to a non-profit group, AATNA, in Alaska on May 6.

The total Navy ship time for UNOLS in 2000 is in the range of \$13M to \$14M. The ONR portion of the Navy support is up to approximately \$10M which reflects the increased ship use by 6.2 programs. They hope to be able to stay at this funding level. Of the \$10M, \$700K is supporting major ship equipment. Some of this funding is going to Navy owned UNOLS ships and some is going through the Defense University Research Information Program (DURIP) and can be applied to any ship. ONR Program Managers have been encouraging field programs on all UNOLS vessels, not just Navy owned.

ONR is interested in technology upgrading and would like to see some consideration of technology replacement. Many times this option gets ignored as ships get old. However,

in many cases hulls are in fine shape, so a technology replacement could be applicable. A discussion followed that evolved into new ONR ship technologies. Sujata explained that there is a lot of interest in new propulsion concepts. Some new innovative technology concepts being developed by ONR could perhaps be applied to the UNOLS fleet. This is an issue that UNOLS should pursue with the Navy.

In terms of projections, it appears that ONR is using more ship time and this trend will continue. They also are projecting that ships may be around longer with the implementation of technology replacement/upgrades.

National Science Foundation (NSF) – Mike Reeve provided a report for NSF. Work has been on going with the agencies' fleet long-range plan. Principles of the fleet plan are included as *Appendix V*. A working group including NSF, ONR & NOAA have met twice. An outline has been developed and plans laid for meetings every two weeks. Additionally, a retreat or workshop may be planned in the summer. The working group will refer to the fleet statistics developed by the UNOLS Office and FIC, as well as the Biennial Review information in drafting their long-range plan. They are also planning to apply the synthesis of the *Futures* reports. The NSF Geosciences plans will also be included. Issues such as long term planning of the ARGOS system and deep moorings all have implications for ship systems both in observations and deployments.

The group will prepare a short document of about 15 pages outlining the optimal size of the research fleet and regional distribution. They would like to present the draft of the plan to the community at the fall AGU. The report should be ready for full approval by the end of the year so that it could be presented to the National Oceanographic Research Leadership Council (NORLC) in spring 2001 for their endorsement. After development of the long-range plan, it will be revisited and reviewed every five years.

Larry asked "what is FIC's role in this planning effort?" FIC represents the community and is tasked to advise Federal agencies on fleet planning issues. Mike Reeve explained that the purpose of the community meeting (planned for late summer) is to broadly address the science directions and not just the fleet. Chris Measures asked if the agencies' long-range plan will be used as a blue print for the future fleet. Mike Reeve indicated that this is basically a plan on how to proceed from the federal perspective. It was recommended that Academic Fleet Review material be posted on the web.

Mike Reeve continued by reporting that in November the recommendation was made that FOFCC should fall under the purview of NOPP's NORLC. This would provide a federal home for FOFCC. By falling under NOPP, the FOFCC will have a larger federal audience and will look at all oceanographic facilities, not only ships. The name of FOFCC is likely to change to the Federal Oceanographic Facilities Committee (FOFC).

NSF Fleet Inspections – Joe Coburn introduced the fleet inspection topic. The UNOLS ship operators are very concerned in the hiatus of the ship inspection program. Some ships now three years from their last inspection. Dolly indicated that due to busy schedules and personnel changes at NSF the contract has not gone out. NSF is very

aware that they need to resume the program. They know that it is a very important task and that they have to do it. The last contracting process was terminated because of a legal technicality and as a result NSF wants to make sure that it gets processed properly this time. Delays are primarily a result of the staff being over committed and short-handed. It was indicated that a letter from UNOLS on this subject would have no effect on getting the process moving along. Mike Reeve explained that they will be re-advertising the facilities program manager position vacancy (Dick West/Dolly position). Any assistance by UNOLS in advertising the position would be appreciated.

Future Science Needs – Larry indicated that the FIC members have reviewed the *Futures* reports from a facilities perspective. The *Futures* document for FUMAGES (MG &G), APROPOS (Physical), OEUVRE (Biology) and FOCUS (Chemistry) were reviewed, see *Appendix VI*. It was noted that there is an immediate need for high-capacity, shallow draft coastal vessels. Additionally, it was noted that ROVs and AUVs will change facility requirements, but will require ships for handling and servicing.

A discussion by FIC continued on facility needs. There is a need for regular observations by ships (similar to BATs or HOTs). The new technologies that are coming on-line that will need ships for support. Physical oceanographers will need to make large-scale measurements (from meters to kilometers). The need for multidisciplinary programs using multiple ships was indicated in the FOCUS report.

The Committee drafted a list of facility related issues and needs:

- Service of new technology.
- Federal funding proportional ship time.
- Sustained time series support.
- Sampling capabilities in high sea states.
- Towed body, etc to support meter to kilometer scale measurements.
- Maintain flexibility to support both process and 'monitoring' operations.

Larry questioned whether or not this is an area that FIC should be addressing. Mike Reeve indicated that this is a useful task. FIC can explain how the science directions can be supported from a platform perspective.

A discussion followed regarding the roles for new ships. Will designs be different for ships involved in experimental type work than those involved in monitoring? It was generally agreed that ships should remain flexible. With difficulty in predicting the future science directions, specialization of ship designs could lead to pre-mature obsolescence. It was recommended that FIC review the *Futures* reports and create a matrix of facility needs based on the scientific requirements.

Lunch Break

Future Science Needs - The Committee discussed the need for new Science Mission Requirements (SMRs) for the various class ships. The current set of SMRs is at least ten

years old. Do they need to be updated? There were no SMRs for small ships. It was noted that although the SMR documents are old, much of the material is still valid and useful. The UNOLS Office will provide the FIC with the inventory of SMRs for review and possible update. Members will be tasked to review and recommend updates as necessary. It was suggested that we first examine the available material for smaller ships since they are the older vessels and will need replacement soonest. Scientific requirements have been changing. Larger science packages are being handled and deployed needing more robust handling gear. Berthing and manning needs to be addressed as a greater number of technicians may be needed to support the more sophisticated instrumentation and equipment. New international regulations such as International Safety and Management Codes (ISM) may impact ship requirements.

The Committee discussed the impact on ship operations and possible design considerations with respect to ISM and International Organization of Standardization (ISO). ISM is mandatory for all ships operating in foreign waters. There are a number of questions facing the community in regard to ISO. ISO is not mandatory but may be a stepping stone for ISM compliance. There is the question of what science operations and to what degree do we want to encompass ISO. Should future SMRs indicate that science operations are to be in compliance with ISO9002? The Academic Fleet Review is recommending that UNOLS strive for excellence. ISO9002 provides compliance. The UNOLS Council has formed a committee to address the issue of quality of service and excellence. FIC will keep abreast of their efforts.

In summary, the SMRs need to be reexamined to determine if updating is required or if additional SMRs would be beneficial. This need is based on the following:

- Ship retirement and new science directions as defined by the *Futures* documents may dictate the need for new SMRs.
- Existing SMRs should be reviewed to see if new research requirements could be met (i.e. larger science package deployment/recovery from ships).
- Additional berthing demands: Additional technicians may be needed to support more sophisticated equipment. New manning requirements may be required to comply with new regulations.
- ISM/ISO and its impact on science operations.

FIC's Guidelines for New Ship Acquisition – The FIC revisited the viewgraphs presented at the beginning of the meeting and included as *Appendix IV*. It was pointed out that the University of Delaware has developed an excellent model for new ship acquisition and other institutions should be encouraged to follow it. It was further suggested that FIC should examine the fleet statistics as presented in Appendix IV to determine where shortfalls can be expected. FIC should then alert the community of the need for facility replacement in the very near future. They should encourage institutions to contribute to the fleet planning and replacement process. Community wide support for fleet improvement is essential.

Accept Minutes – The minutes, of the November 9-10, 1999 FIC meeting were accepted as written.

Regional Ship Planning – Plans for a regional ship planning meeting were presented by Lee Black, see *Appendix VII*. He began by presenting a list of the regional ships along with their respective age. Many of the regional ships are quickly approaching their midlife or retirement age. There are many common concerns that these ships are facing. It makes sense that the operators work together to address these concerns. The regional group is also looking to FIC for assistance in their planning efforts.

Lee reviewed four common concerns facing the regional ship operations:

- 1) How far does the science community want to go toward enhancing the regional research vessels for science mission capability during midlife refits?
- 2) What will the science enhancement cost be and is it a good value?
- 3) How will midlife work be funded?
- 4) How will new US and international regulations affect these vessels.

Lee reviewed the five-year usage summary for the regional vessels by agency. The group is looking for other, non-traditional, ways to fund some of the overhaul requirements. One possible source could be EPA support. EPA may help fund re-powering systems for ships in the state of California.

The regional group will be reviewing the new regulations. The small ships many times fall into a gray area when it comes to compliance requirements.

Lee presented a list of major work items to extend the life of the regional vessels. These included:

- main engines - \$200k (SPROUL)
- marine gears
- generator sets
- electrical control panel
- major piping and sea manifolds
- HVAC
- vents
- refurbish labs
- Refurbishment of accommodations.

Scientific enhancements for the regional ships include:

- capability to carry and access standard 20' containers – this is an issue
- Carry larger science party
- Enhancement of winch and wire systems
- Dynamic positioning
- ADCPs
- Bottom profilers
- AUV/ROV support
- Enlarge lab area
- Etc.

The full list of enhancements is included in Appendix VII. Lee pointed out that no ship is asking for all of these enhancements, and some things are not included in the list. It was noted that this list is moving in the direction towards a larger ship. The regional group would appreciate FIC's input and guidance in regard to selection of the science enhancements.

AGOR 26 Update – Sujata Millick (ONR) gave the report on the status of AGOR 26, see *Appendix VIII*. Phase II has begun and includes ship design, construction, test and delivery. The contract for construction was awarded on 28 October 1999. Construction time is scheduled for 23 months after contract award. The University of Hawaii will be the operator.

The principal characteristics include:

- 50 day endurance
- Accommodations for 48 persons (30 scientists)
- LOA 182', Beam 88'
- Draft =25 feet
- Operational in sea state 6.

The construction is proceeding under the 804 Government process. Under this process, the government provided industry with a set of mission requirements. Industry and the shipyard are responsible for design and construction of the vessel. This process permits approximately 80% of the project cost to go directly to the ship, i.e. more money towards ship construction and less to management. The structural load methodology has been approved by ABS. Noise control is a major issue and is under study. The model vendor and towing basin have been selected. Minor design changes have been made. Nine months are planned from when the first steel is cut to launch of the ship. After launch, it will take 13 months until delivery. Sujata showed the deck layouts. The hull shape was changed to accommodate the multibeam array.

A keel laying ceremony is planned for the near future. Sujata showed a photo of the shipyard, Atlantic Marine Inc. (AMI). The yard has serviced and built a variety of other UNOLS vessels. Lastly, Sujata showed the contract milestone chart and the NAVSEA project timeline. The timeline estimates that science operations can begin in December 2001.

WHOI SWATH – Joe Coburn reported that WHOI working with The Glostest Associates has developed the design for a new SWATH. The design is complete and funds are being raised to proceed with construction. WHOI is confident that the ship will be built. They expect to be able to request bids in the fall. In all likelihood, WHOI will seek UNOLS vessel status. A crew size of 5-persons is planned. This will result in an estimated cost of \$5k per day. The design meets WHOI's needs. Cruises of four to five days are anticipated. The ship will have an endurance of two weeks.

CAPE HENLOPEN Replacement – Matt Hawkins of the University of Delaware has assembled a comprehensive plan for the acquisition of a new ship for that institution. The preliminary planning package is included as *Appendix IX*. This plan may serve as a template for other institutions planning new ships. The University of Delaware has established a "Delaware Research Vessel Committee" (DRVC) and their first meeting is planned for April 10, 2000 in Lewes, DE. The meeting will focus on developing SMRs for the ship. They hope to have the SMRs to the FIC by June of this year for comment. Development of the concept design will begin once the SMR's are finalized. The acquisition plan calls for the new ship to come on-line within the next six years. The University of Delaware is discussing the possibility of amortizing the construction costs in the day-rate.

Impact of New Institutional Vessels on the Fleet – The FIC held a discussion on how the new small and capable SAVANNAH, GULF CHALLENGER, SLOVER (ODU's new vessel) and CONNETICUT will impact the fleet. The ships offer a good capability that many times is a less expensive option. They appear to be serving local needs and do not impact negatively on the overall UNOLS Fleet.

It was noted that RV WALTON SMITH is a very capable small ship with an operating range that competes with the operations at Harbor Branch and LUMCON. If the University of South Florida continues with their plans for a new ship, additional impact in the region may be felt. A suggestion was made that another chapter be added to the Biennial Review addressing the impact of small ships.

The meeting adjourned at 3:45 pm for the remainder of the afternoon. The FIC agreed to meet for informal discussion following dinner.

March 22, 2000 - HEALY is in port in Baltimore, MD

The meeting resumed at 8:00 am on 22 March with a report from Larry Atkinson on the previous evening's FIC discussion. The committee agreed to write a summary of each of the *Futures* discipline reports. These summaries will be included in the Biennial Review.

Biennial Review – Larry reviewed each section of the on-line Biennial Review report, <http://www.unols.org/fic/authship.html>. A correction was noted that "Robertson" Dinsmore, not Robert Dinsmore, authored the History of UNOLS. Many of the sections of the Biennial Review report still have no input.

The FIC reviewed the "New Regulations" section prepared by Joe Coburn. This was followed by a discussion on ABS classification. It was recommended that all new UNOLS vessels be ABS classed. Joe Coburn was tasked to develop a paper defining the implications of ABS classing a vessel. He will circulate it to the FIC for review and consideration for endorsement. It would be costly to class existing vessels. It would be a very expensive option during refits. The Glosten report on "Planning Considerations for a New Research Vessel" is available through the UNOLS Office.

There was a discussion on the "Technical Support" section of the Biennial Review. There was some question on what this section should include. It was suggested that this section could characterize the types of technical service provided as well as the level of support (people) that could be found on each ship. The question needs to be addressed of whether specialized service teams should be provided and if so how to support these teams. A lengthy discussion on this topic followed.

Some specific changes to the Biennial Review document were recommended:

- Combine "Future Research Requirements" and "Future Observing Systems"
- Add a new section "Interesting Trends" - This section would include the UNOLS Fleet utilization charts.
- In the "New Assets" section it was recommended to include a matrix of ship capabilities, existing and new.
- Andy Bowen and Mark Chaffee were recommended as authors for the ROV and AUV sections, respectively.
- It was suggested to link the "Ocean Observatories" section to the recent workshop on this topic. Keir Becker should be contacted.
- Request input from Jim Meehan on the "Fisheries Surveys" section.
- Tom Aldredge (USCG, Woods Hole) and Gary Green were suggested as authors for the Shallow Water Surveys.

The FIC will try to have some of the Biennial Report sections on-line by August in time for the agency retreat.

FIC and Alaska - Leonard Johnson of the University of Alaska gave the report by beginning with the background information on ALPHA HELIX. A status report on the ALPHA HELIX replacement efforts is included as *Appendix X*. ALPHA HELIX aging and in urgent need of replacement. The ship was last upgraded in 1980. The SMRs for the replacement have been developed and endorsed by UNOLS. The SMRs indicate a general-purpose oceanographic ship between of 180 and 200 feet in length, with some ice strengthening, and a trawling capability to support fisheries research. There is concern within the community that a ship is needed in that area and that the community needs to be a part of the planning and procurement process. There was some discussion on the status of NSF funding for future ship construction. U. Alaska plans to submit a proposal to support the development of a conceptual design for the vessel. The Committee discussed the various ways funding might be made available for this ship.

New FIC Members – Due to other commitments, it was recommended that Terry Whitledge (U.Alaska) replace Tom Weingartner on the FIC. It was also recommended that the UNOLS Office advertise for another FIC volunteer. The position should be filled by a sea-going scientist from a non-operator institution with a research discipline in MG&G.

Next Meeting – Mike Prince cautioned that the UNOLS Office budget has been reduced and that support is lower. As a result, the number of Committee meetings will likely

need to be reduced. Mike indicated that we need to come up with new strategies for getting our business accomplished. The FIC members indicated that meetings are very useful. One scenario to minimize costs would be to hold the next FIC meeting immediately before the Council meeting in September (September 20th, day before Council meeting). NSF and ONR program managers should be invited to the next meeting. It was also suggested that a one-hour presentation by ONR on technology upgrades be scheduled.

FIC Meeting Tasks - Annette DeSilva reviewed the tasking from this meeting.

The meeting was adjourned at 10:00 am

Appendix I

03/17/00

Fleet Improvement Committee
United States Coast Guard Icebreaker, *USCGC HEALY*
March 21-22, 2000

Tuesday, March 21, 2000 (Norfolk, VA)

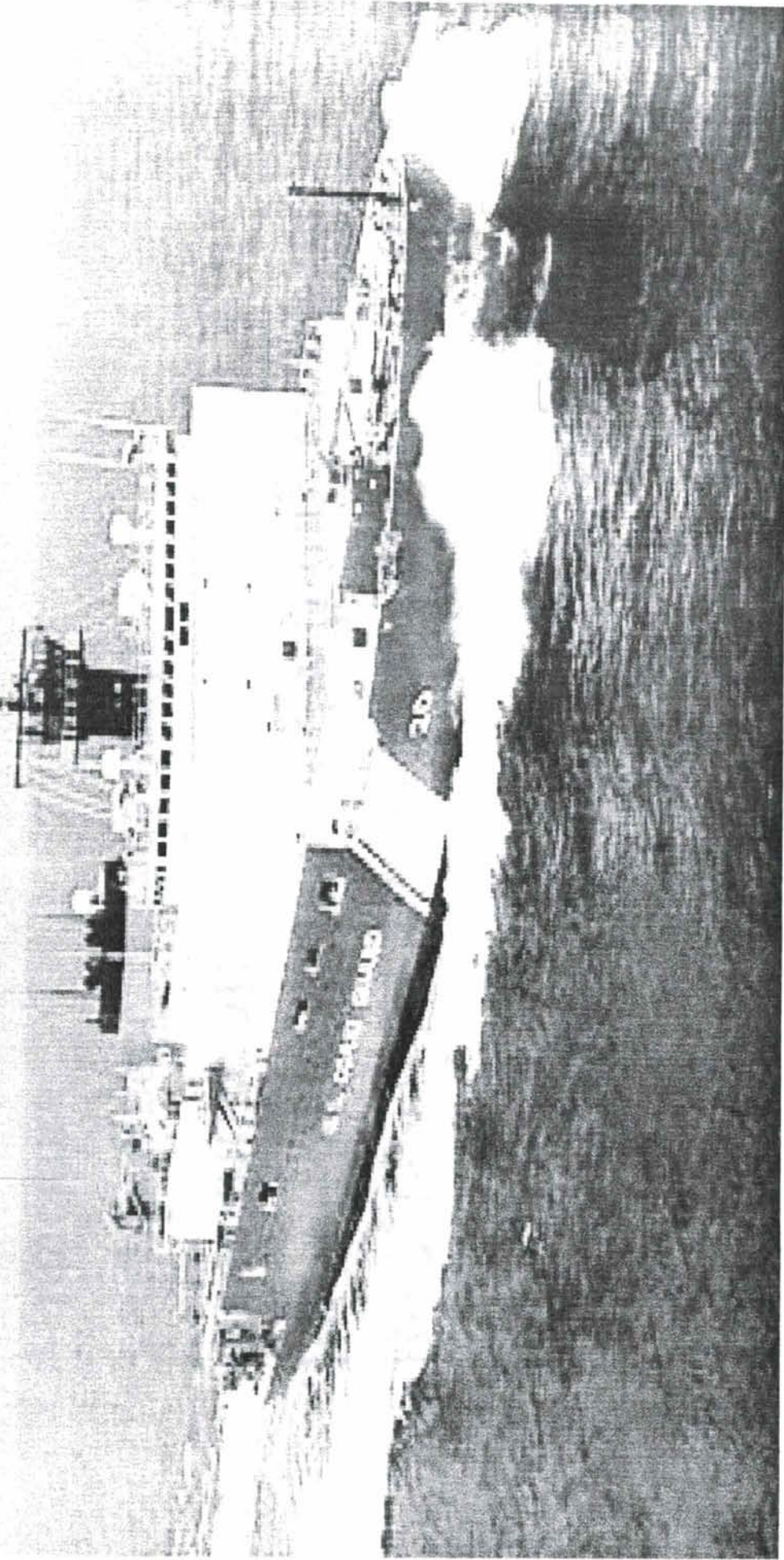
- 9:00 am** **FIC Welcome and Introduction** - FIC meeting participants will convene in the HEALY Conference Room. Larry Atkinson will welcome the Committee and review meeting logistics.
- 9:10 am** **Discussion of Agenda Items** - Review agenda and identify any needed modifications.
- 9:20 am** **Accept Minutes** - Accept the minutes of the November 9-10, 1999 FIC Meeting.
- 9:30 am** **Report from UNOLS** – Jack Bash will report on UNOLS activities over the past year and plans for the future.
- 9:45 am** **Agency Reports** - NSF, ONR, NOAA, and USCG representatives will provide agency reports.
- 10:30 am** **Break**
- 10:50 am** **Future Fleet Planning** - Fleet Replacement/upgrade needs and timeline will be discussed.
- 11:20 am** **Future Science Needs** - Prior to the meeting FIC members were asked to review the NSF Futures disciplinary reports and identify future science needs. Can these research needs be met using existing facilities? Are additional facilities needed?
- 12:00 pm** **Lunch Break**
- 1:00 pm** **The Need for New SMR's** - There will be a discussion on the need for new Science Mission Requirements.
- 1:30 pm** **FIC's guidelines for new ship acquisition** - Draft guidelines for new ship acquisition will be reviewed. The guidelines are intended to help define FIC's future role in this process.
- 1:50 pm** **FIC/Agency Activities** - How does FIC interact/assist agency activities relating to fleet planning?
- 2:15 pm** **Break**
- 2:45 pm** **Regional Ship Planning** - Lee Black (BBSR) will discuss regional ship planning efforts. Regional ships include the CAPE Class vessels. The group's planning efforts will address mid-life refits, SMRs, timelines, and replacements.

- 3:30 pm** **AGOR 26 Update** - Sujata Millick will provide an update on the AGOR26 project.
- 3:50 pm** **CAPE HENLOPEN Replacement Plans** - University of Delaware's plans for replacement of CAPE HENLOPEN will be reviewed.
- 4:10 pm** **Impact of New Institutional Vessels on the Fleet** - A discussion on how the new, small and capable SAVANNAH, GULF CHALLENGER, SLOVER (ODU's new vessel) will impact the fleet.
- Tour of HEALY - A tour of HEALY will be offered on Day 1.*
- 5:00 pm** **Adjourn Day 1 Business**
- 9:00 am** **The UNOLS Biennial Review of Sea Going Oceanographic Facilities** – Larry will review progress on the report and discuss strategy for increasing input.
- 10:00 pm** **FIC and Alaska** - The relationship/communications between FIC and the University of Alaska in replacement plans for ALPHA HELIX will be discussed.
- 10:30 am** **General Business**
- Review of FIC Member Terms
 - Scheduling of Next Meeting
 - Recap of FIC Action Items

Adjourn FIC Meeting

Fleet Improvement Committee
on board the USCGC Healy

March 21-22, 2000



Future Fleet Planning

- By 2:45 Today we want to have a plan for a FIC/UNOLS vision of the future based on the realities of:
 - replacement/upgrade needs
 - timelines
 - future science needs

Need for New SMR's

- What SMR's need developing based on the timeline and *Futures* needs.

FIC Guidelines for new ship acquisition - Points we want to make

- Include community through FIC
- Plan well ahead
- What else?

FIC/Agency Activities

- The Agencies are moving ahead...do we sit and wait or get our opinion in?

Regional Ship Planning

- Lee Black (Bermuda) and regional ship planning efforts.

AGOR 26 Update

- Sujata Millick

Cape Henlopen Replacement

- U. Delaware's plans for replacement.
- This may be the template for doing it.

Impact of new Institutional Vessels

- Savannah, Gulf Challenger, Slover, Miami (?), all coming on line.
- How do they affect the regional vessels?

Biennial Review

- More is there but....
- We need some help.

FIC and Alaska

- Status

General Business

- FIC member terms
- Next Events
 - Review
 - SMR's
 - Agency Interaction
- Recap of Action Items

Appendix II

FIC - March 21-22, 2000

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Appendix III

DRAFT
The Role of FIC in Fleet Planning

- I. Periodically evaluate the state of the UNOLS Fleet as well as science research directions to determine future facility needs.
 - A.
 1. Develop/Update SMRs to address these needs.
 2. Initiate the Conceptual Design Process.
 - Or
 - B.
 1. When appropriate, request that institutions and/or consortium initiate ship refits/replacement efforts. FIC will work with these groups to assure that science mission needs are adequately addressed.
- II. FIC will work with institutions to review and advise on plans for vessel refit, replacement, or acquisition.
- III. FIC will keep abreast of non-UNOLS facilities to determine if these assets would offer an added capability to the UNOLS Fleet. When appropriate, FIC will recommend to institutions owning these facilities that they consider applying for UNOLS vessel status.

Appendix IV

“It Shouldn’t Take That Long!” (But It Does) Examples

Navy Oceanographic Initiatives - October 1984: Build Three New AGORS, Upgrade Knorr/Melville

AGOR-23 (Thompson)

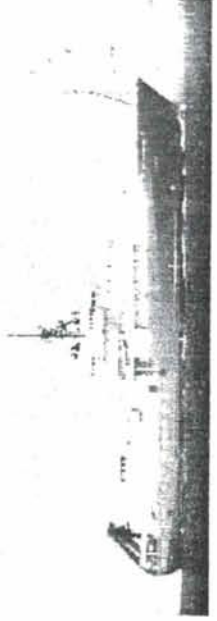
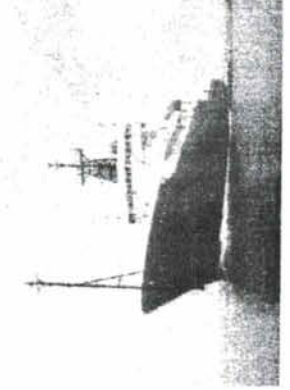
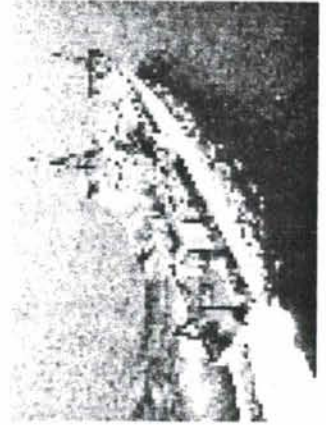
1983 Science Requirements Stated
 1984 SECNAV/CNO Initiative
 1985 Point Design Begun (with community inputs)
 1986 Funds Appropriated
 1986 (Nov) RFP
 1987 (Aug) Award
 1988 (Oct) Start Construction

1990 (Feb) Delivery
 1991 Enter Fleet

AGOR-24 (Revelle)
 1991 Funds Appropriated

1993 Begin Construction

1996 Enter Fleet

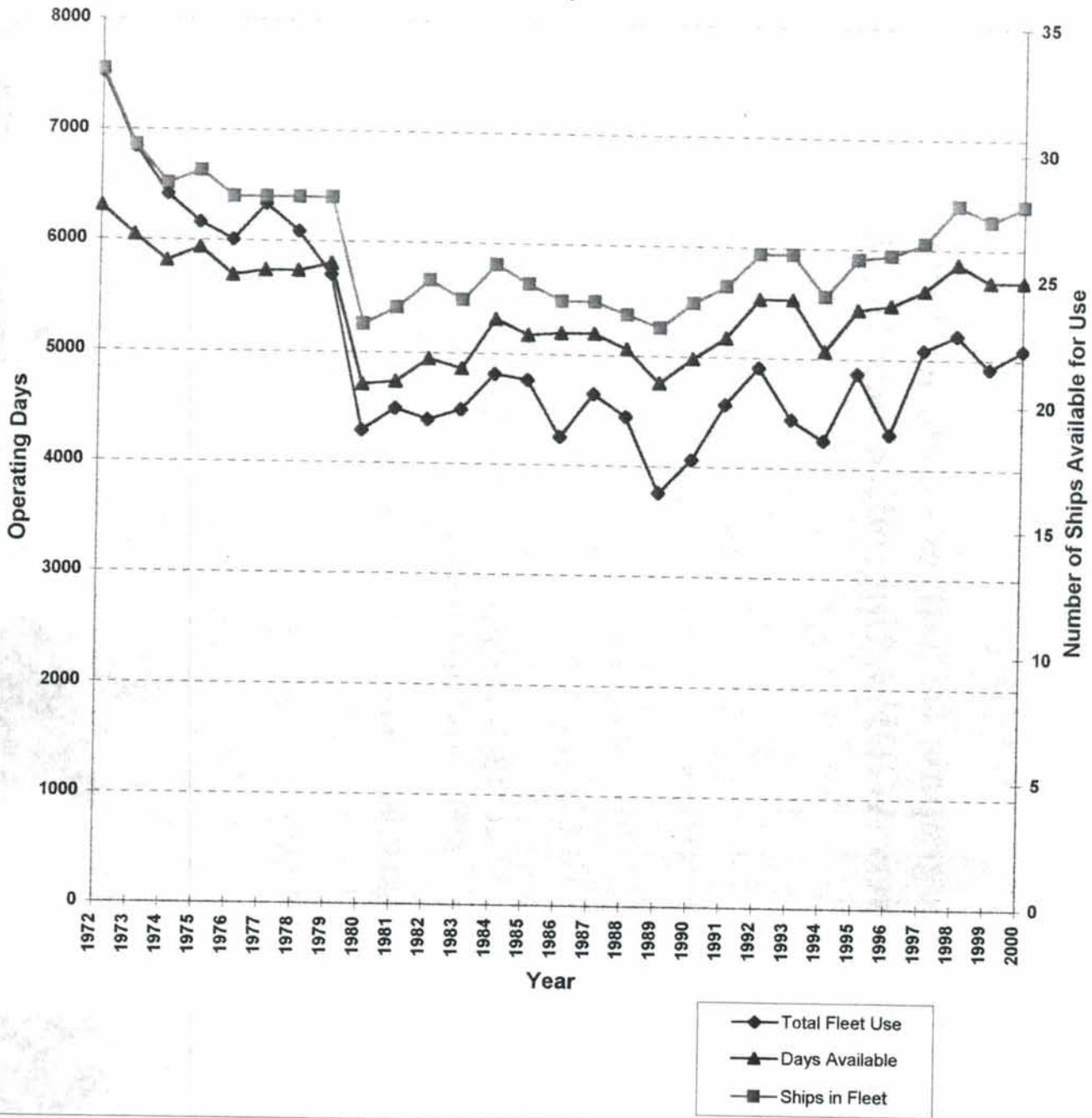


AGOR-25 (Atlantis)
 FY'92 Funds Appropriated

1994 Begin Construction

1997 Enter Fleet

UNOLS Fleet: Days Available, Days Used, and Number of Ships

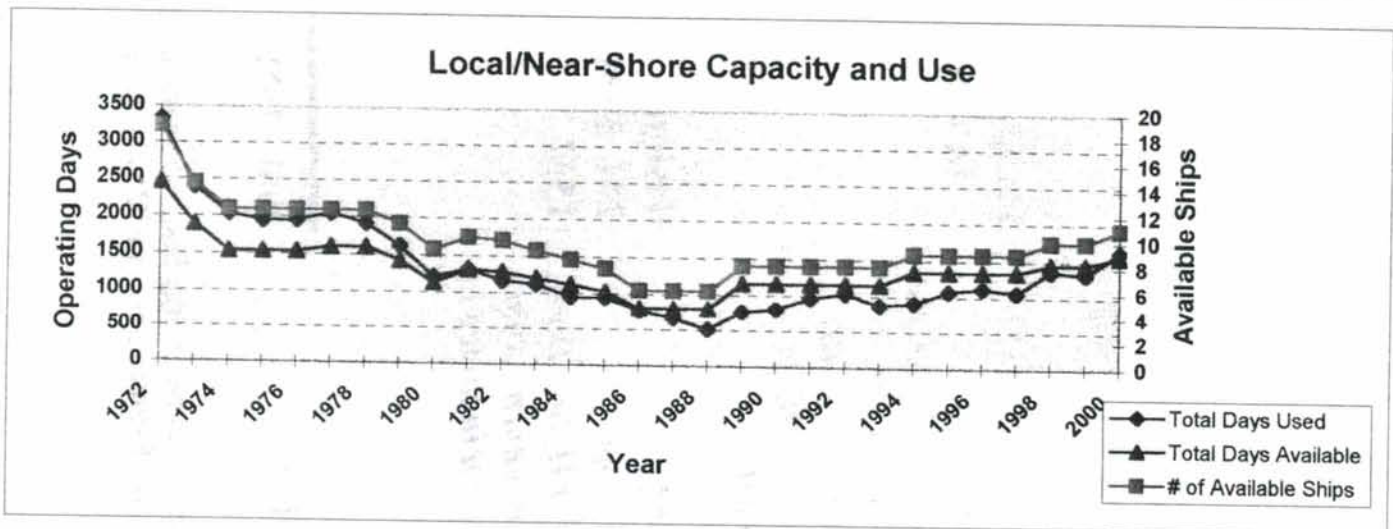
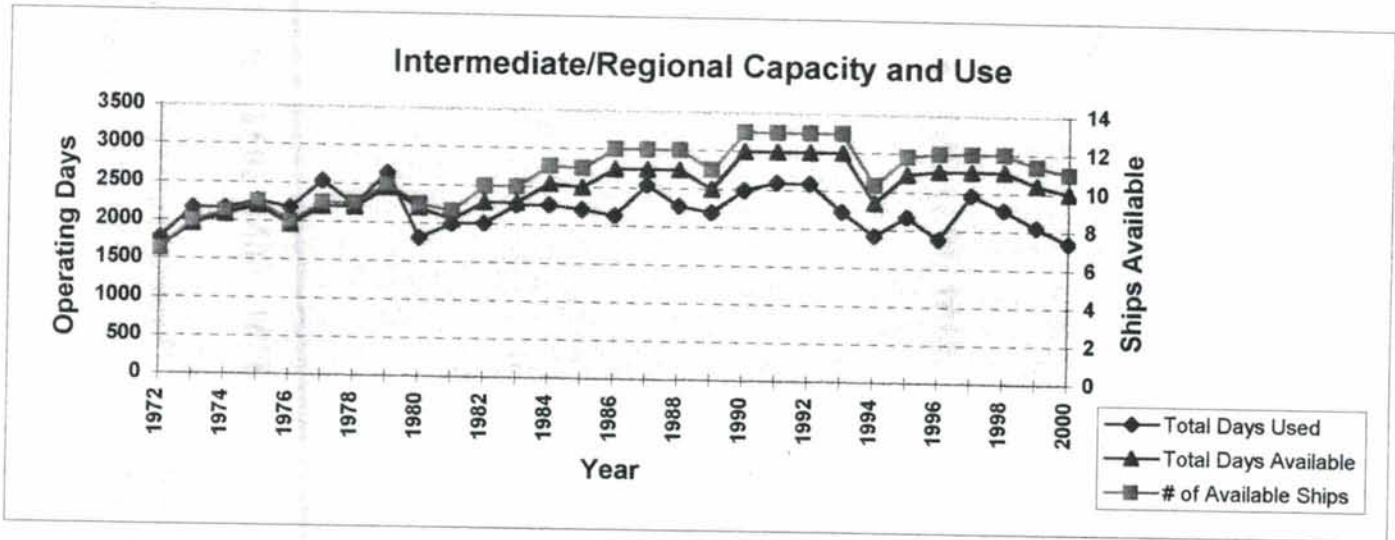
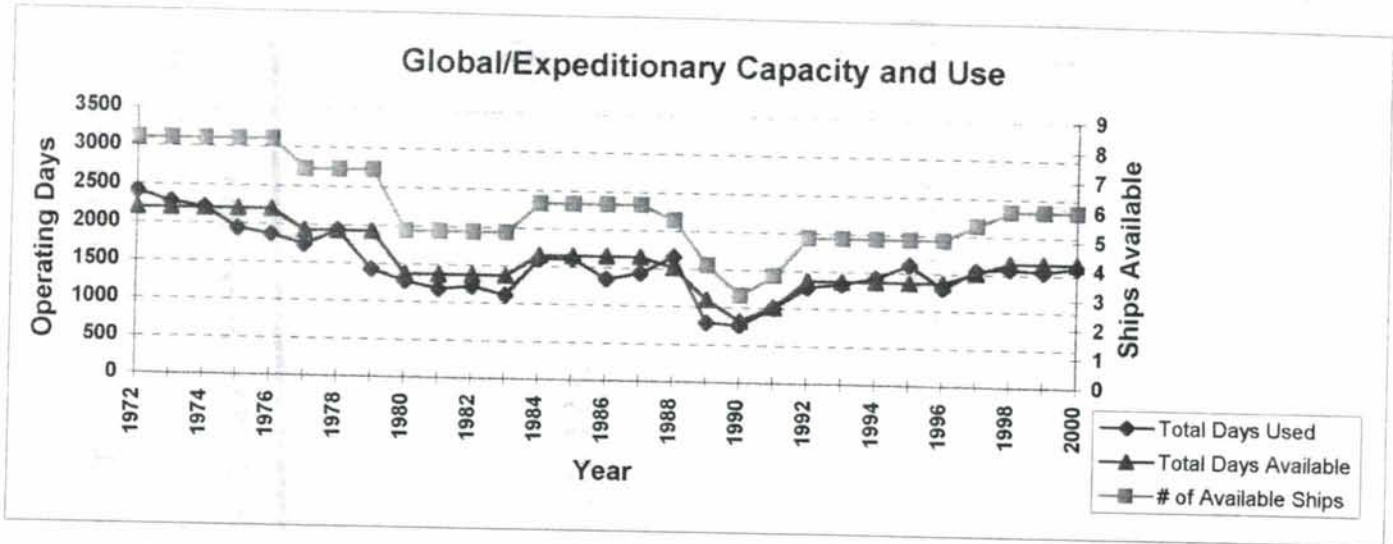


This chart shows the total Fleet utilization by year as well as the number of ships available for use. Also shown are the total days for a Full Operating Year (FOY) as defined by the Research Vessel Operators' Committee (RVOC).

RVOC Recommended Definition of a Full Operating Year (FOY):

Class	Length	FOY (days)
Class I&II	200-300 ft.	275
Class III	150-200 ft.	250
Class IV	100-150 ft.	180
Class V	<100 ft	110

Fleet Utilization by Class

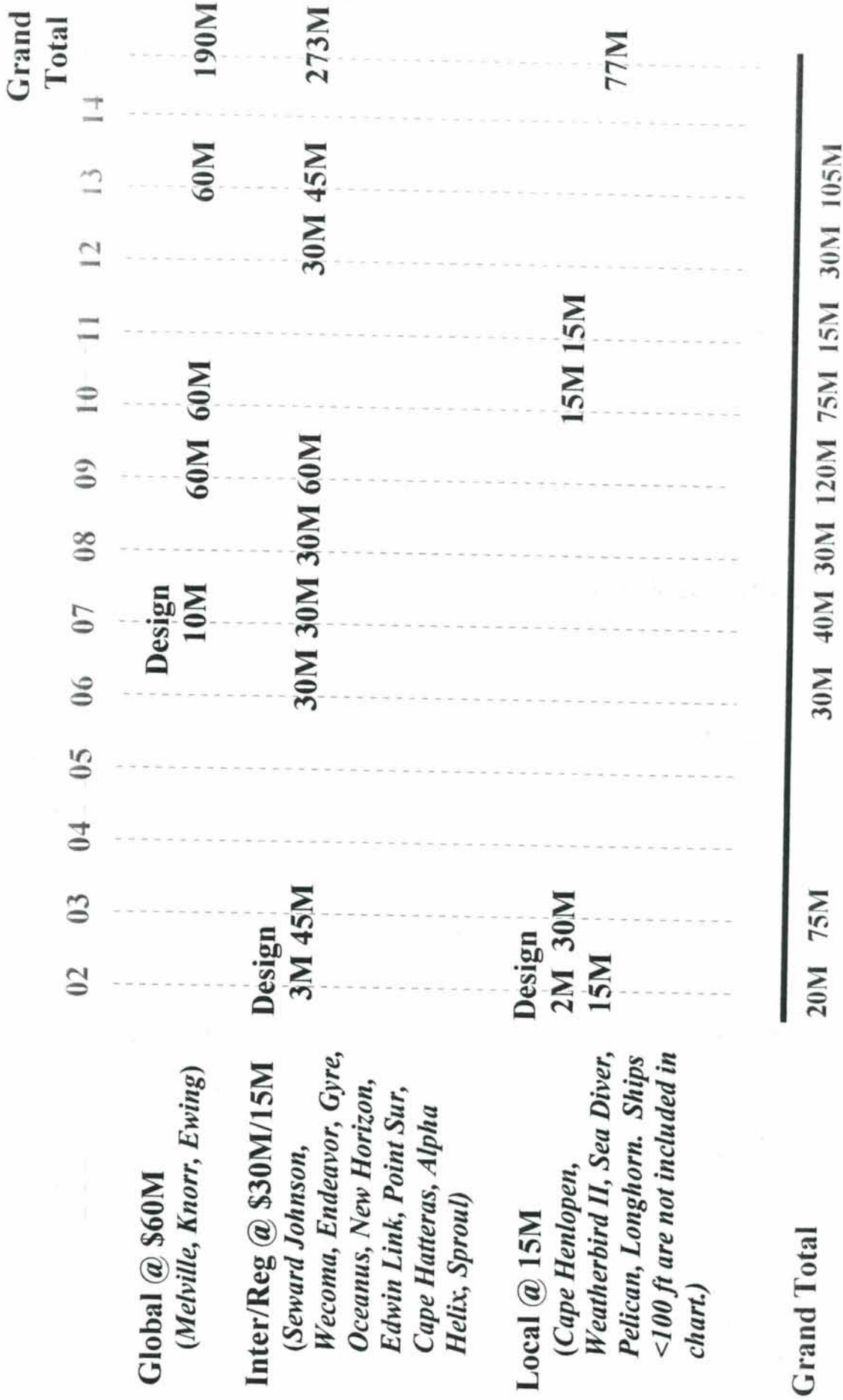


RVOC Recommended Definition of a Full Operating Year (FOY):

Class	Length	FOY (days)
Class I&II	200-300 ft.	275
Class III	150-200 ft.	250
Class IV	100-150 ft.	180
Class V	<100 ft.	110

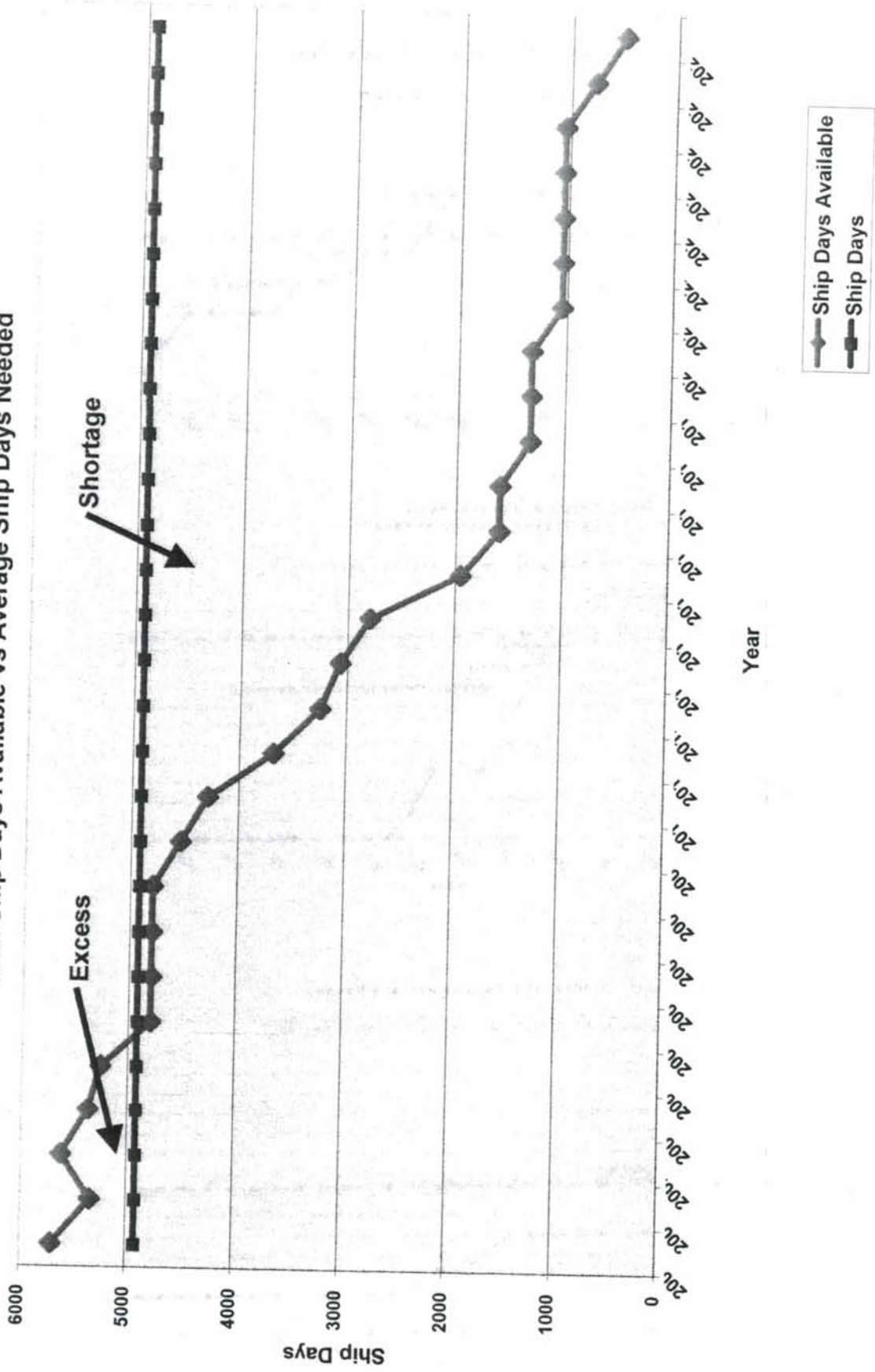
Figure 7: The Cost of Replacement

One-for-One Replacement Cost Estimate



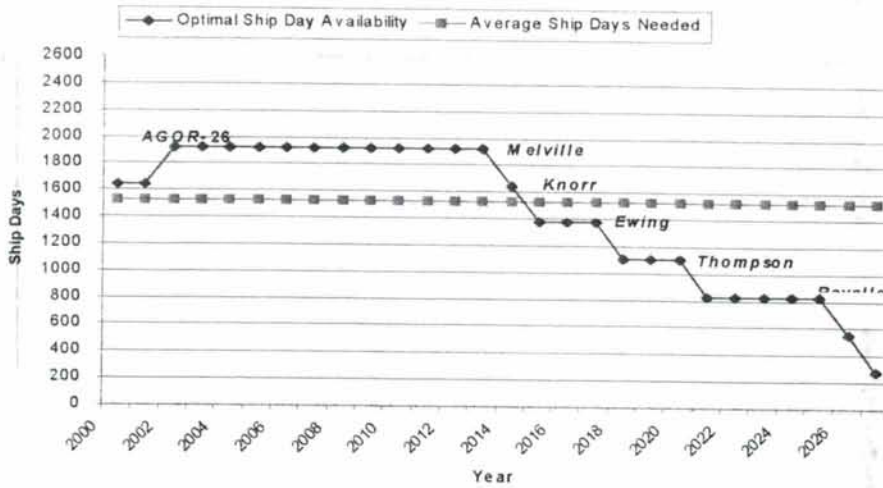
Notes: Construction Times: Large Ship = 5 years, Intermediate Ship = 3 years, Small Ship = 2 years
 Cost Estimates are in FY2000 Constant Dollars. Gyre, Alpha Helix and Longhorn scheduled to go out of service before 2003

Total Ship Days Available vs Average Ship Days Needed

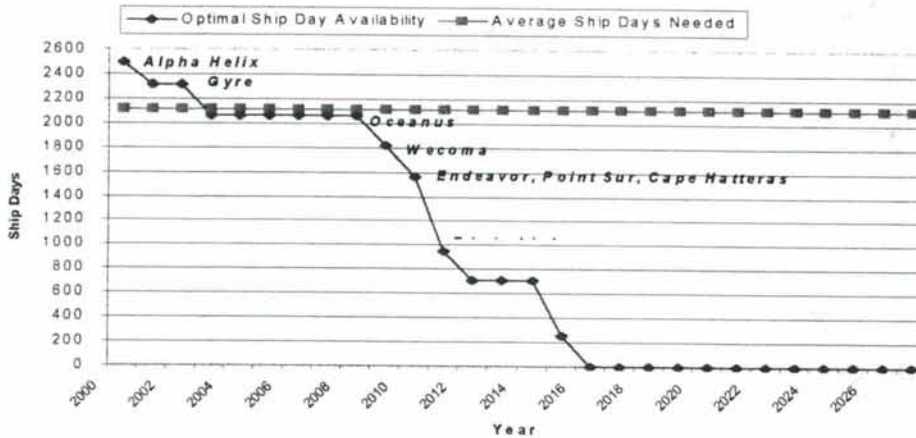


Optimal Total Ship Days versus Average Ship Days Needed

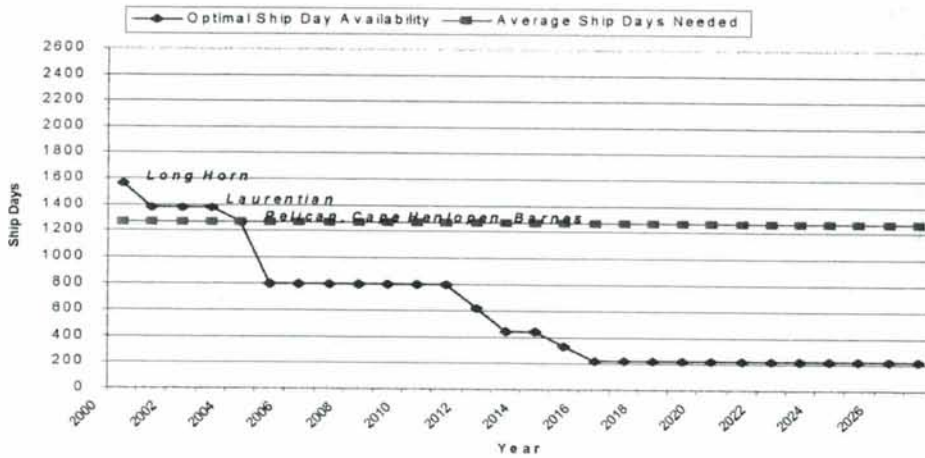
Global/Expeditionary- Optimal Ship Days vs Average Needed



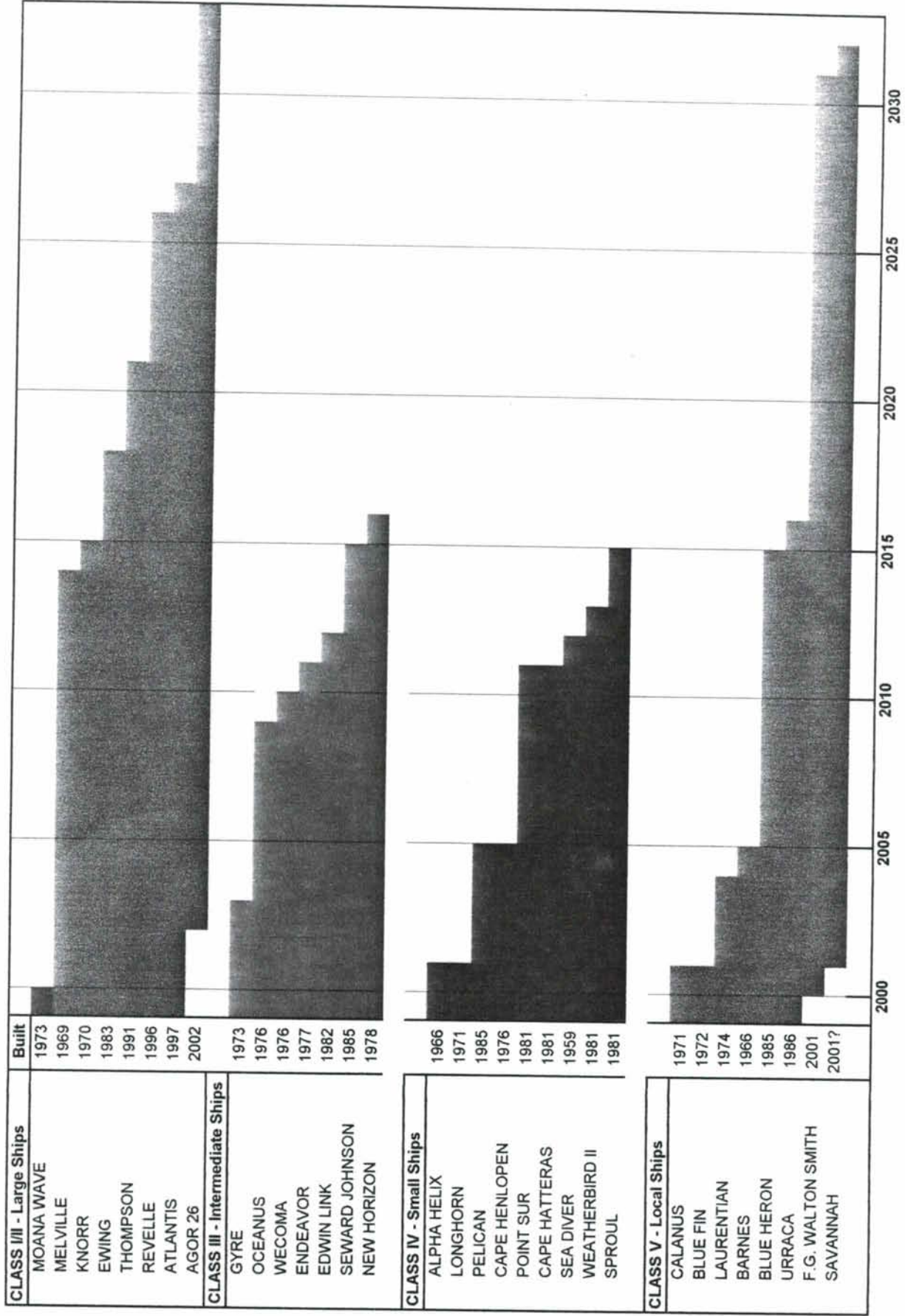
Intermediate/Regional Vessels
Optimal Ship Days vs Average Needed



Local/Near Shore - Optimal Ship Days vs Average Needed



Projected Useful Life of UNOLS Ships



Appendix V

Federal Agency - Long Range Planning Efforts

"The federal agencies funding research in oceanography should prepare and maintain a long-range plan for the modernization and composition of the oceanographic research fleet that reaches well into the 21st century."

PRINCIPLES OF THE FLEET PLAN

SCOPE

Purpose? To produce a document defining the federal view of the optimal size of the academic fleet and its regional distribution, both in terms of numbers and specific capabilities, by which to rationally plan for replacement.

Which ships? The main focus is on the ships of the academic research fleet, irrespective of ownership, i.e. the UNOLS fleet. Where appropriate, recognition of the roles of other federal vessels will be included (e.g. NOAA fisheries and research vessels).

What size range? The Federal Agencies will determine which academic ships it will consider under the plan, but for now it will be the Cape class upwards.

Duration of perspective? Thirty years overall (an average vessel lifetime), a detailed focus on the next 10 years, a re-assessment and update every five years.

Complexity of the report? Limit it to a readable document of no more than 15 pages, while recognizing that it would be supported by existing and new data, and existing and new reports and community commentary.

Timeframe for completion? Initiate any plans for data collection and workshops immediately, complete data collection and workshop activity by the end of summer, concurrently hold working group (us folks) and FOFC meetings to develop federal positions, synthesize information and complete draft report by the end of the calendar year, call for review by federal and community interests, finalize report by Spring, 2001.

Main federal agencies? ONR, NSF, NOAA, representing FOFC and NOPP.

Main stakeholders? The scientists of the academic community and their representative organizations (e.g. UNOLS, CORE).

FOFCC is likely to become FOFC (Federal Oceanographic Facilities Committee) under NOPP. The plan would be submitted through FOFC to NOPP to be approved by the NOPP agency heads (the National Oceanographic Leadership Council NORLC) at their Spring 2001 meeting.

Appendix VI

FUMAGES

- Undersea Observatories
- Event-detection systems
- Nearshore, shoreline, shallow water, high-energy: sampling, imaging and monitoring.
-

FUMAGES Comments

From page 204.

Field Programs:

-there is evidence of a significant decline in the U.S. managed facilities supporting the needed field programs, including those for collecting
-recent data sets have suffered because of inadequate technical support and system maintenance.
-general lack of consistent support for important infrastructure needed to support field related programs.
-equipment is expensive ... irregular scheduling...technicians at sea or beach for long periods.
-Reliance on a simple 'recharge' system does not work efficiently, as it is not reasonable to tell highly trained technicians to wait two, three or more months for the next cruise and the next paycheck.

APROPOS (Physical)

- High capacity, shallow draft coastal vessels are needed most urgently. (pg. 21).
- AUV's and ROV's will change requirements but require ships.
- More SOO's and VOS's for long term data sets.
- Sensors on merchant ships.

Ocean Ecology (OEUVRE)

- I couldn't find any recommendations.

FOCUS - Chemistry

Facilities that provide access to the sea, including the UNOLS Fleet, can be one of the most expensive components of oceanographic research, and **facilities must be used efficiently**. The chemical oceanography community generally recognizes this.

In some cases, this recognition can negatively impact small science programs that need to work in remote areas or during bad weather. This type of science may produce a **small science party on a large ship**, or it may **involve long transits for relatively few science days**. Several steps can be taken to mitigate this type of problem.

First, the **funded and proposed plans for ship use should be widely distributed**. Publication of these data in an easily accessible format on the Internet is under development by UNOLS and should be continued.

Second, scientists should be encouraged to **review these ship requests**, particularly if they plan to operate in remote areas, to see if it is possible to combine science parties or otherwise enhance efficient use of ships.

Efforts such as these **will reduce costs of providing facilities support and increase the proportion of funds** that can be used to support the basic science.

Appendix VII

Regional R/V Meeting

Inner Harbor, Baltimore

March 22 & 23, 2000

AGENDA

Wednesday, March 22nd

- 0900 Impact of U.S. & international regulations on regional research vessels. Focus on tonnage law and crewing requirements.
- 1130 Transit to the *Healy* for lunch and tour.
- 1330 Developments in the revision of 1988 science mission requirements (SMR) for regional research vessels.
- 1400 Break.
- 1500 Scope of proposed midlife work to enhance the SMR capabilities of regional research vessels.
- 1600 Funding support for midlife work.
- 1700 Adjournment.

Thursday, March 23rd

- 0900 Overview, by individual operators, of current/future research cruises and midlife work contemplated for their vessels.
- 1020 Break.
- 1040 3-5 year plan for proposed midlife work on regional research vessels.
- 1120 The need for an independent midlife survey on regional research vessels
- 1200 Lunch.
- 1300 Open discussion.
- 1500 Adjournment.

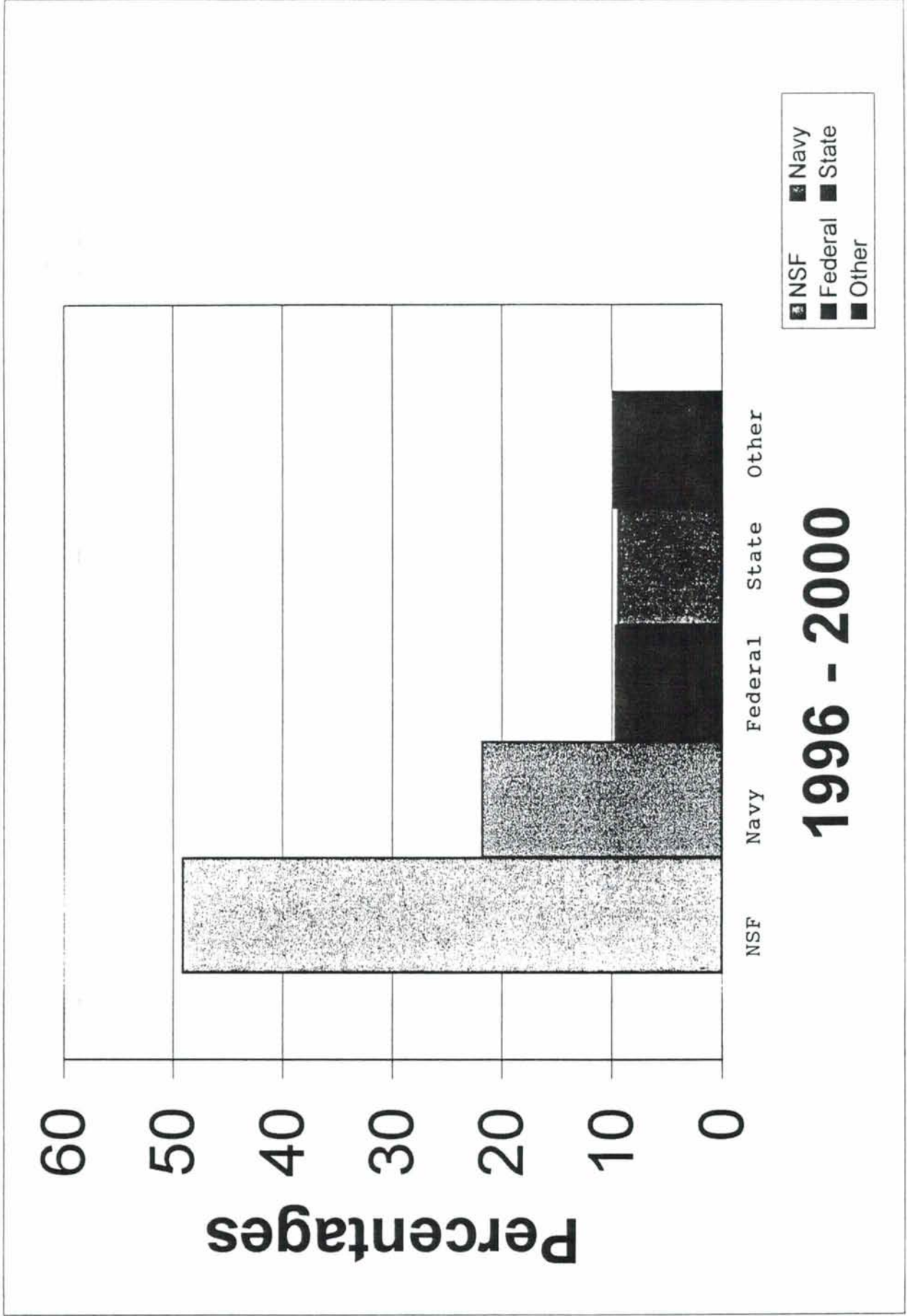
REGIONAL RESEARCH VESSELS

Ship Name	Age	Length	Owner	Operator
Sea Diver	41	113	HBOI	Harbor Branch Oceanographic Institute
Alpha Helix	34	133	NSF	University of Alaska
Longhorn	29	105	U of Texas	University of Texas
Cape Henlopen	24	125	U of Delaware	University of Delaware
Robert G Sproul	19	125	SIO	Scripps Institute of Oceanography
Cape Hatteras	19	135	NSF	Duke University/Univ of North Carolina
Point Sur	19	135	NSF	Moss Landing Marine Laboratories
Weatherbird II	18	115	BBSR	Bermuda Biological Station for Research, Inc
Pelican	15	105	State of Louisiana	Louisiana Universities Marine Consortium

Regional Research Vessels

Common Concerns

- 1) How far does the science community want to go toward enhancing the regional research vessels for science mission capability during midlife refits?
 - Operators are forming individual Midlife Committees
 - Interact with Fleet Improvement Committee
 - Interact with funding agencies
- 2) What will the science enhancement cost be and is it a good value?
 - Independent pre-midlife survey
 - Cost analysis
- 3) How will midlife work be funded?
 - Research traditional funding sources
 - Share information on non-traditional funding sources
- 4) How will new U.S. and international regulations affect these vessels?
 - Discussion group to review



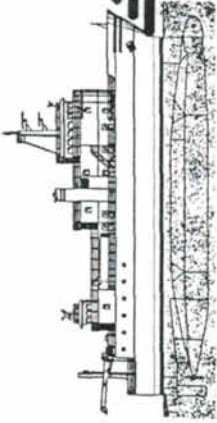
MAJOR WORK TO EXTEND THE LIFE OF VESSELS:

- Main Engines
- Marine Gears
- Generator Sets
- Electrical Control Panel
- Major Piping and Sea Manifolds
- HVAC
- Vents
- Refurbish Labs
- Refurbish Accommodations

SCIENTIFIC ENHANCEMENTS:

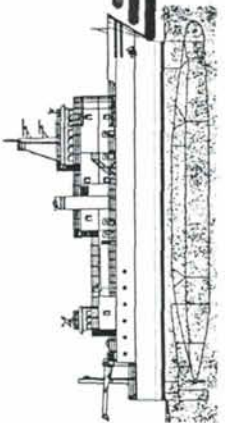
- Capability to Carry and Access Standard 20' Containers
- Carry Larger Scientific Party
- Increase Crane and A-Frame Capacity
- Enhancement of Winch and Wire Systems
- Dynamic Positioning
- Science Information Systems
- Acoustic Doppler Current Profilers
- Bottom Profilers
- AUV/ROV Support
- Roll & Pitch Dampening
- Enlarge Lab Area
- Enlarge Main Deck Working Area
- Increase Transit Speeds
- Workboats

Appendix VIII

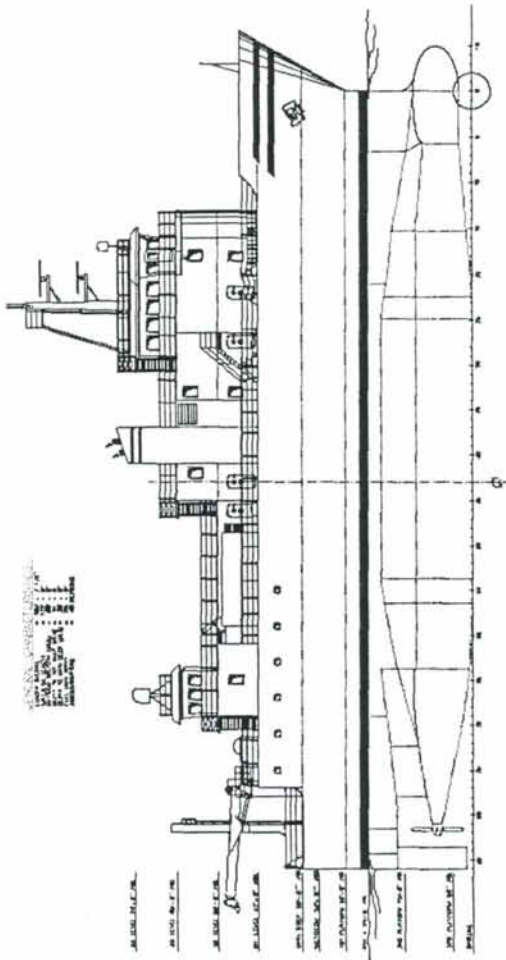


Program Scope

- Program Description - AGOR 26 - SWATH ORV
 - Operated by the University of Hawaii
 - Phase II - Design, Construct, Test & Deliver, Contract Award 28 October 1999
- Industry Team
 - Lockheed Martin, Baltimore - PM, Hydrodynamics, SE&I, T&E, IPDE
 - Atlantic Marine, Inc. - Construction, T&E
 - Guido Perla and Associates - Detail Design
- Deliverables:
 - Basic - \$42.3 M w/ 9 Month Warranty
 - Options (13) - \$2.9 M (Equipment)
 - Options (2) - Spares, Training, and PSA
- Delivery of Completed Vessel - 23 MACA

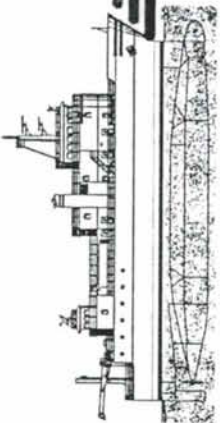


Principal Characteristics



- Dimensions - 182 x 88 feet
- Draft - 25 feet
- Displacement - 2500 tons
- Speed - 15 kts (12 sustained)
- Operational in Sea State 6

- Endurance - 50 days
- Accommodation - 48 persons (30 scientists)
- Oceanographic Research
 - Bottom Profiling Sonar
 - Station Keeping/Track-Line Maneuvering
 - Towing & Handling



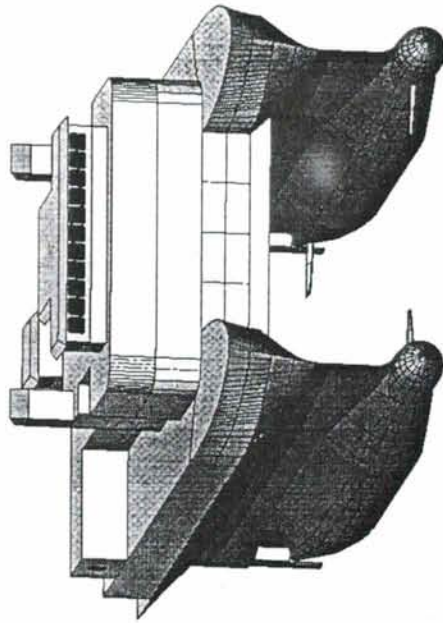
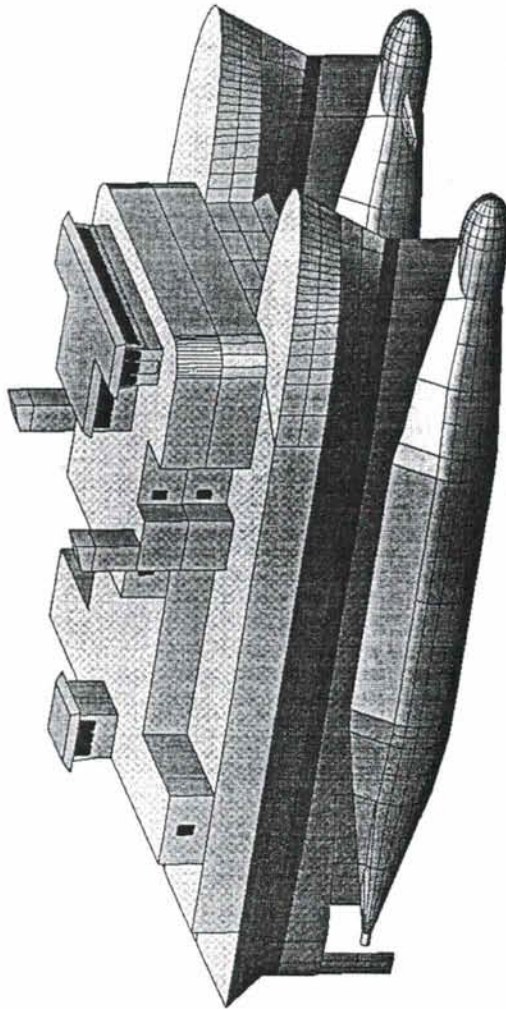
Summary Status

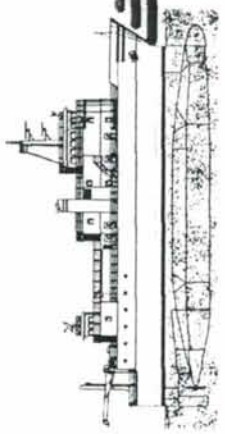
- 804 Process, Government - Industry IPT
 - Structural Load Methodology Approved by ABS
 - Weight Plan, and Noise Control Plan Drafted and in Review
 - Model Vendor and Towing Basin Selected - Resistance, powering, control fins - sizing and effectiveness, natural period for seakeeping.
 - Model being built in Hawaii
 - Testing scheduled for April 00
 - Propeller - Bird Johnson, MS
 - Hull optimized for resistance, stability and fabrication
 - General arrangements defined and approved
 - Baseline noise predictions performed



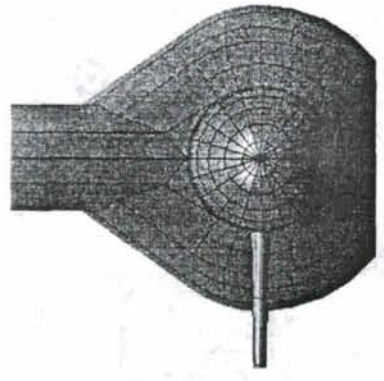
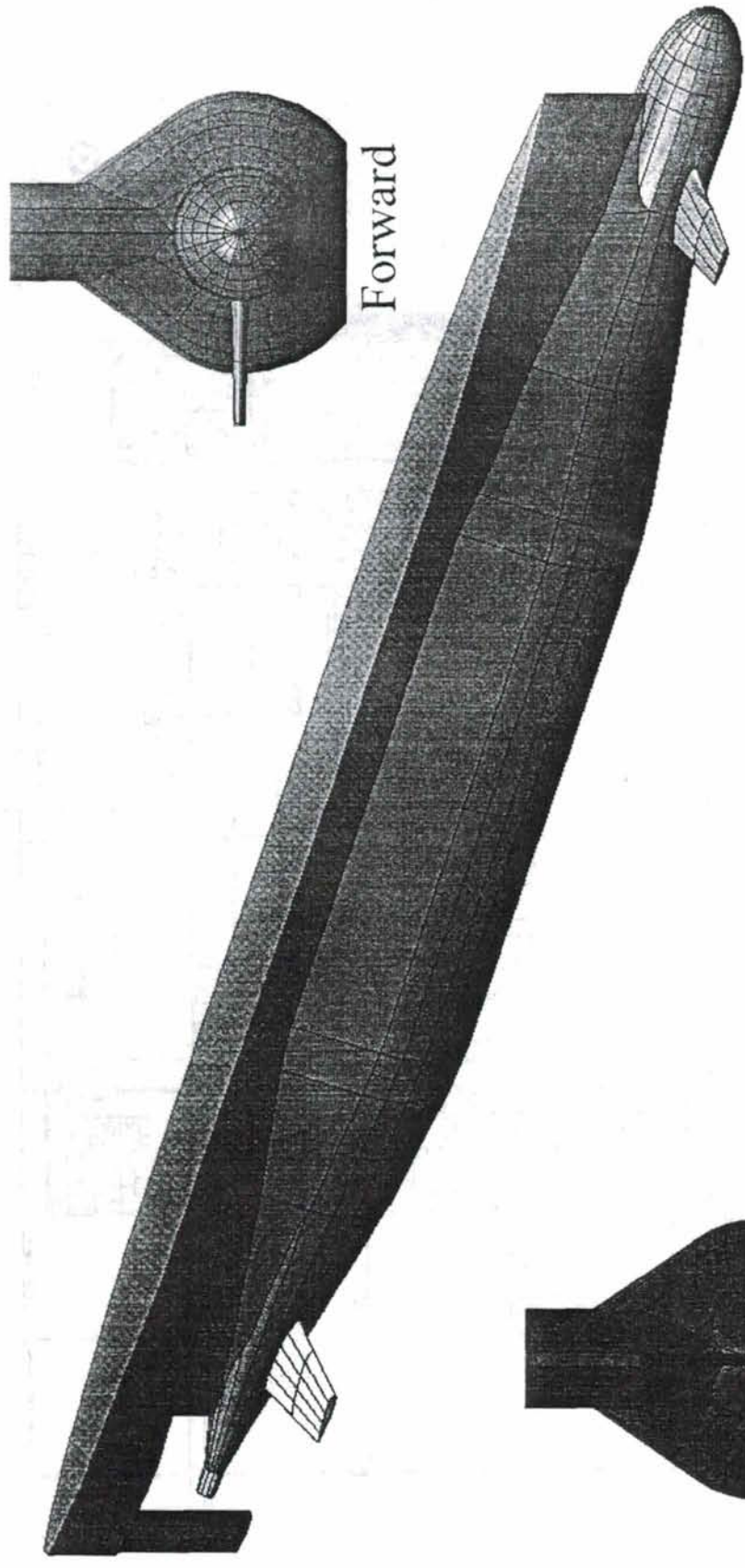
Full Load Draft = 25'
Accommodations = 48 Persons
Displacement = 2555 Lt

Length Overall = 185'-7 1/4"
Waterline Length = 172'-0"
Maximum Breadth = 88'-0"

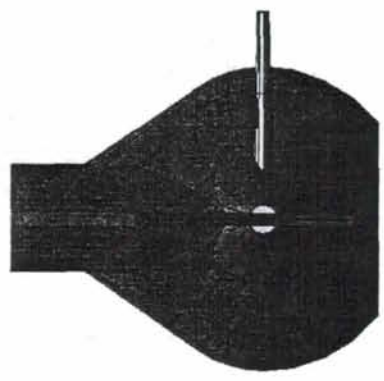




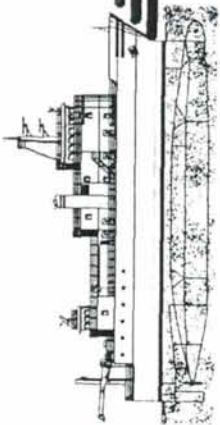
AGOR 26 Hull Below 25 Ft Water Line



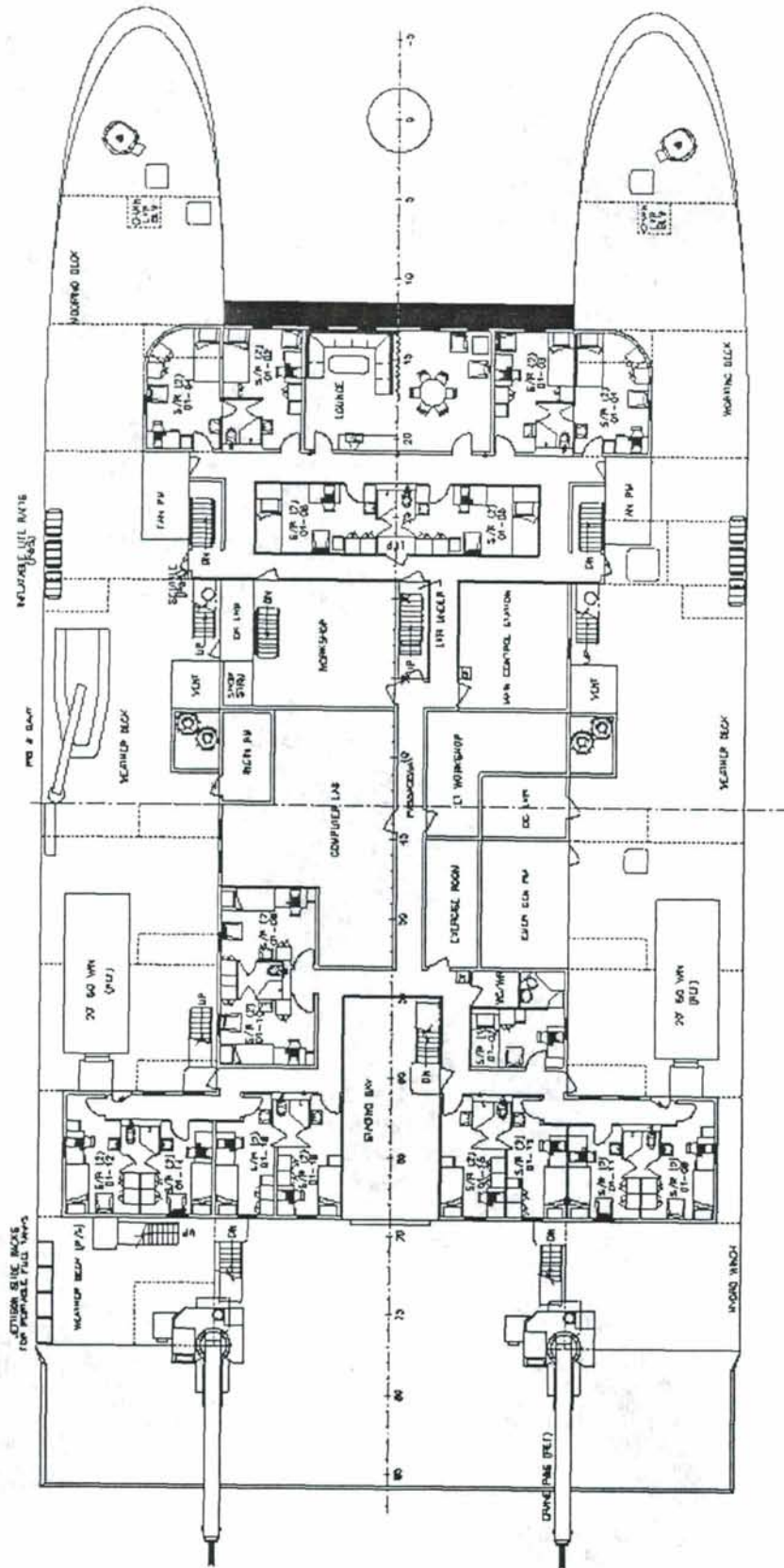
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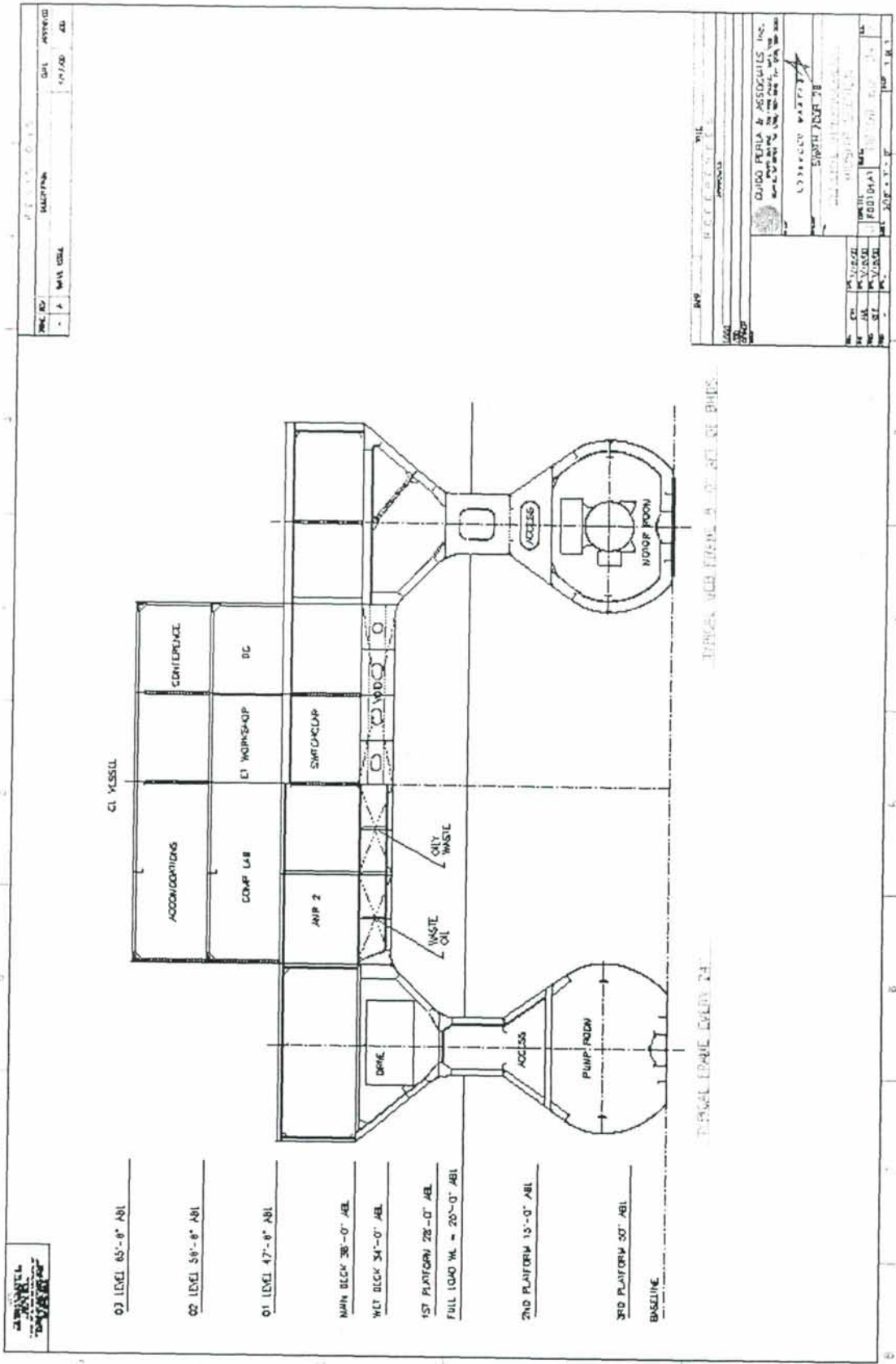
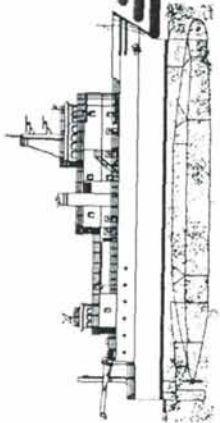
Aft



01 Deck - 47'-5" ABL



PLAN VIEW - 01 DECK



CL Y-SECTION

03 LEVEL 65'-8" ABL

02 LEVEL 59'-8" ABL

01 LEVEL 47'-8" ABL

MAIN DECK 38'-0" ABL

WET DECK 34'-0" ABL

1ST PLATFORM 28'-0" ABL

FULL LOAD W. = 20'-0" ABL

2ND PLATFORM 13'-0" ABL

3RD PLATFORM 30" ABL

BASILINE

INTERNAL ELEVATION 241

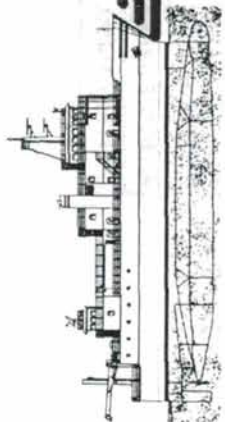
INTERNAL ELEVATION 242

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2			

NO.	DATE	BY	APPVED
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2			

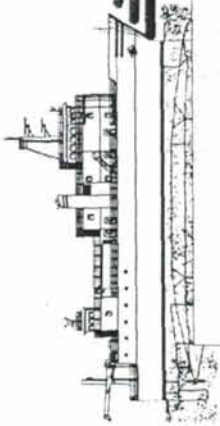
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 DRAWING:
 SHEET:
 TOTAL SHEETS:
 DATE:
 SCALE:
 DRAWN BY:
 CHECKED BY:
 APPROVED BY:
 TITLE:

23-43
 23-44
 23-45
 23-46



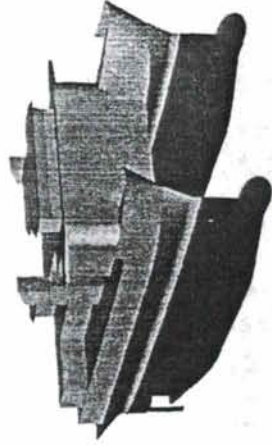
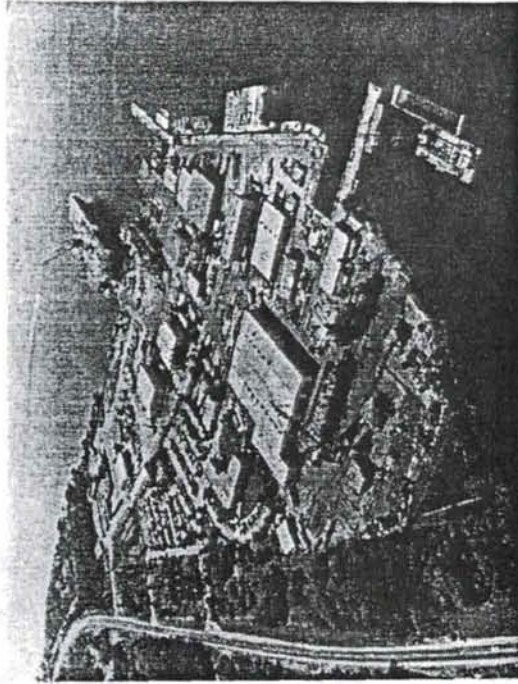
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00 ENTIRE VESSEL				
PERIOD OF PERFORMANCE				
CONTRACTUAL START DATE				
SHIP DESIGN				
ABS APPROACH / APPROVAL				
PROCESS DEFINITION				
WAKE SURVEY				
NOISE CONTROL VENDOR SELECTION				
NOISE CONTROL MECHANICAL / ELECTRICAL INPUT				
APPROACH APPROVAL				
GFI (SONAR)				
ENGINEERING DRAWINGS				
DATA / INTEGRATED MASTER SCHEDULE				
DRAFT WEIGHT CONTROL PLAN				
HULL LINES DEFINED				
PROPULSION SYSTEM INTEGRATOR				
PROPULSION SYSTEM VENDOR				
LONG LEAD PROCUREMENT				
MECHANICAL SYSTEMS DESIGN				
HYDRO DYNAMICS MODEL DESIGN				
HYDRO DYNAMICS MODEL FABRICATE				
PROPELLER / SHAFT DESIGN VENDOR				
STRUCTURES MODEL DETERMINE LOADS				

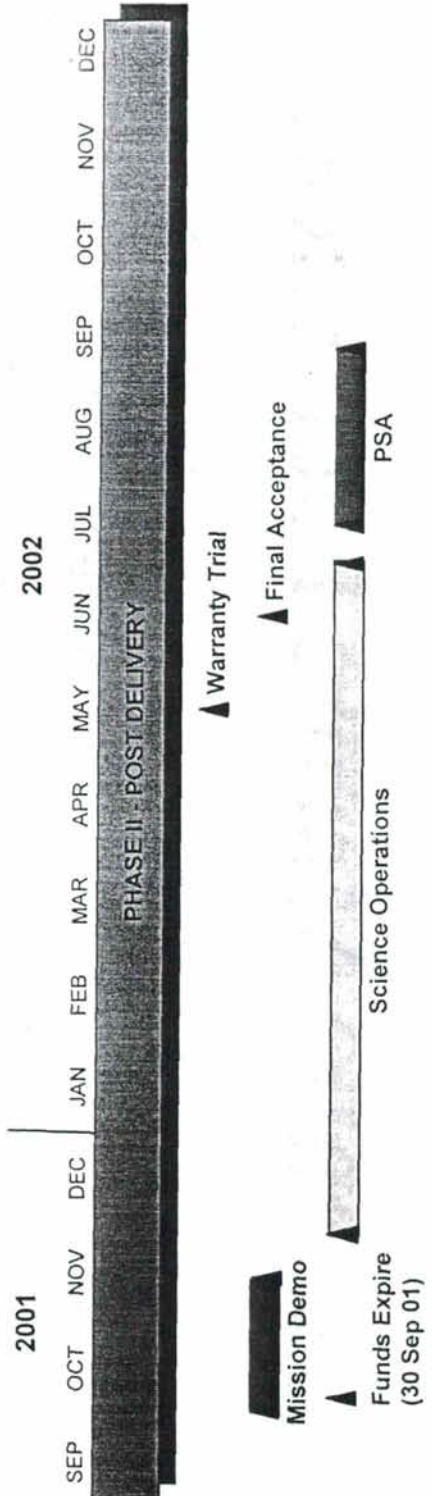
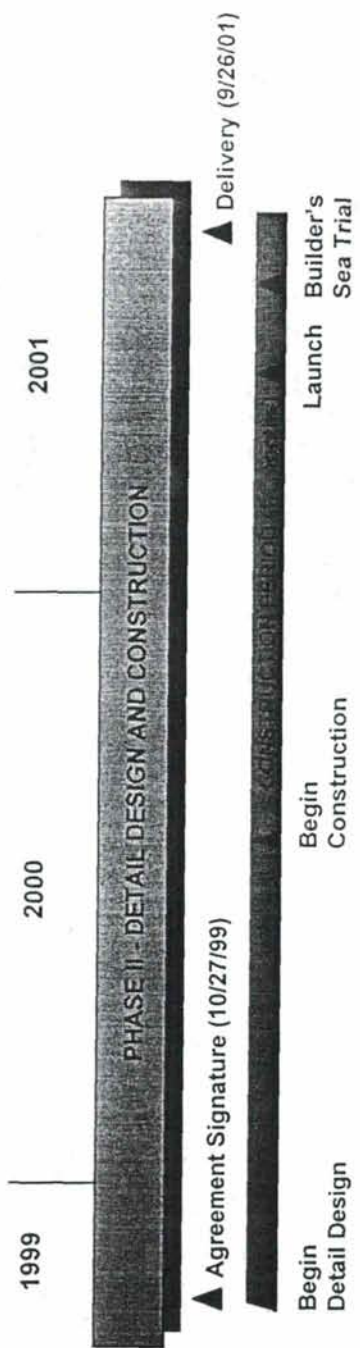
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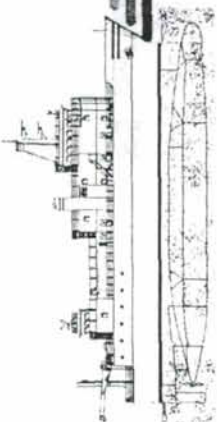


Atlantic Marine Fact Sheet

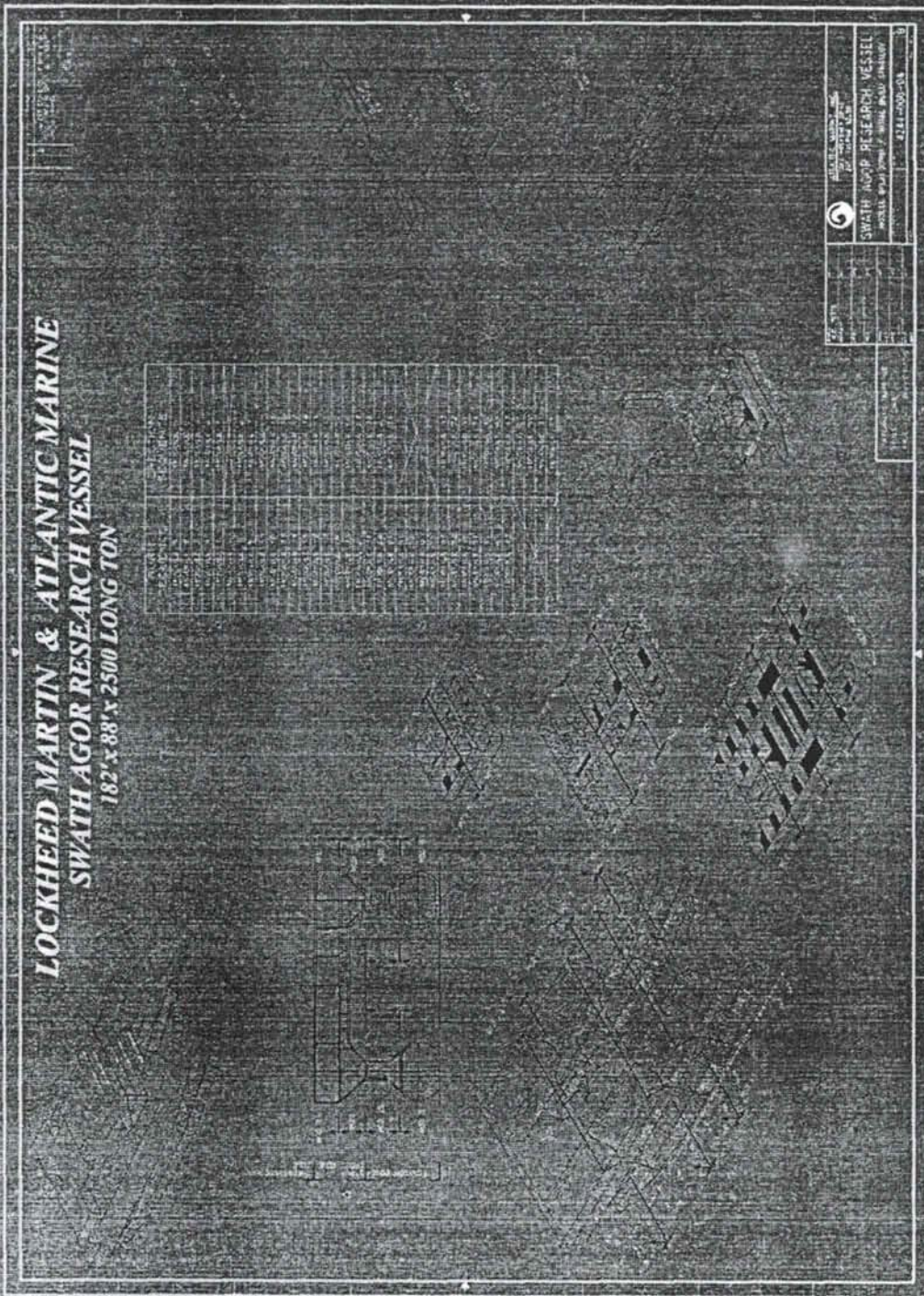
- Started in 1964
- Two miles from the Atlantic Ocean
- River depth of 38 feet
- 81 acres (shared with Atlantic Dry Dock)
- 300-400 employees (non-union)





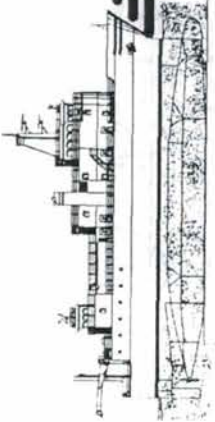


LOCKHEED MARTIN & ATLANTIC MARINE
SWATH AGOR RESEARCH VESSEL
 182' x 88' x 2500 LONG TON

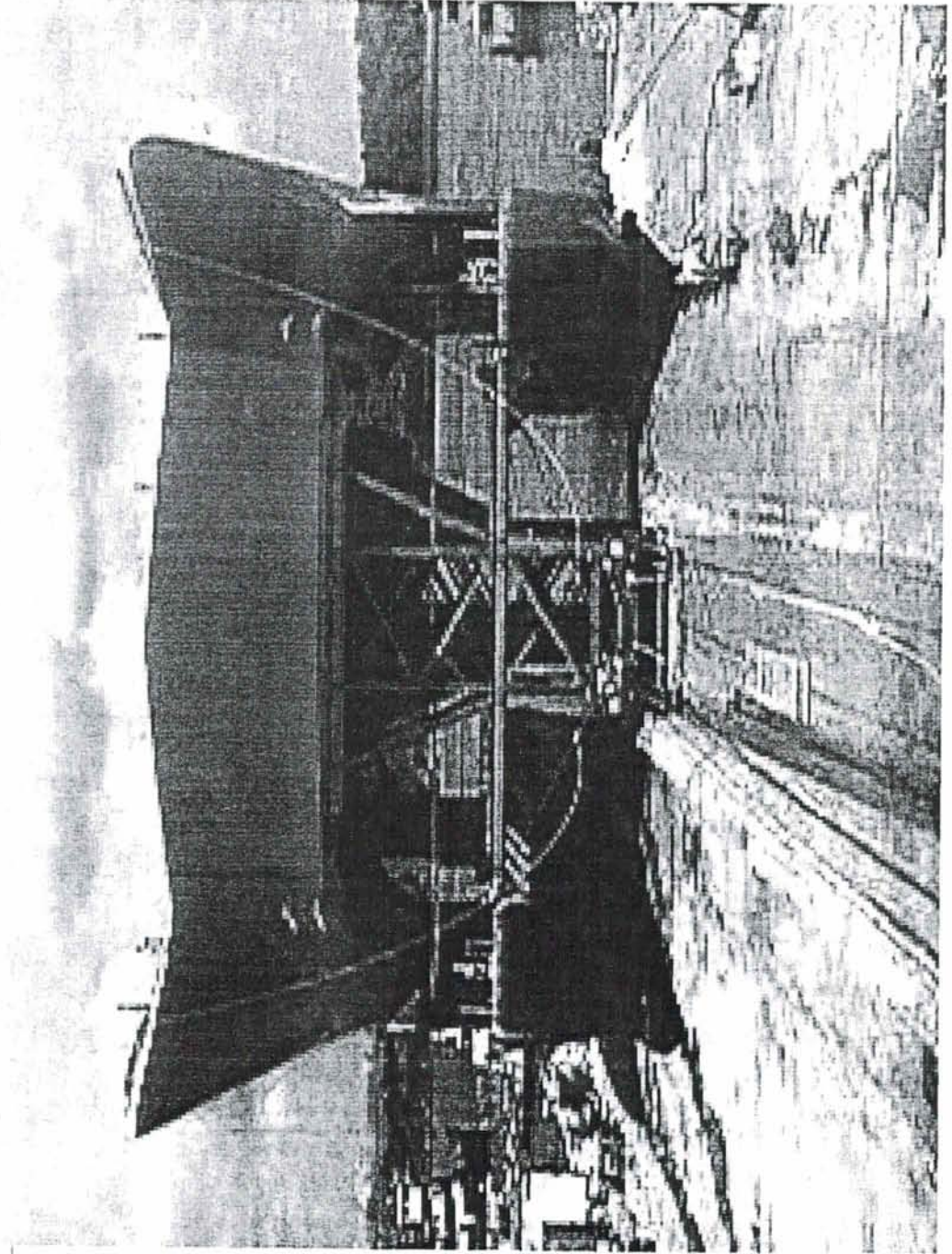


DATE	2/2/88
BY	J. J. ...
FOR	...
PROJECT	SWATH AGOR RESEARCH VESSEL
REVISION	...
SCALE	...
PROJECT NO.	4211-000-01A

LOCKHEED MARTIN & ATLANTIC MARINE

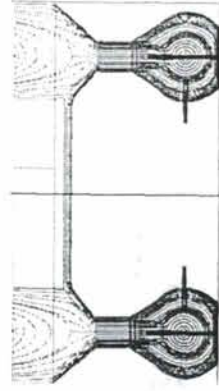
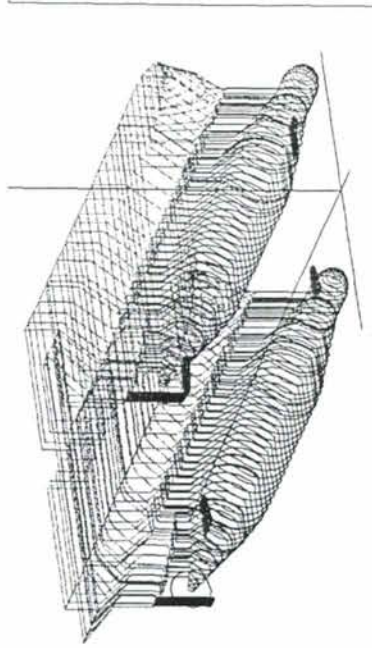
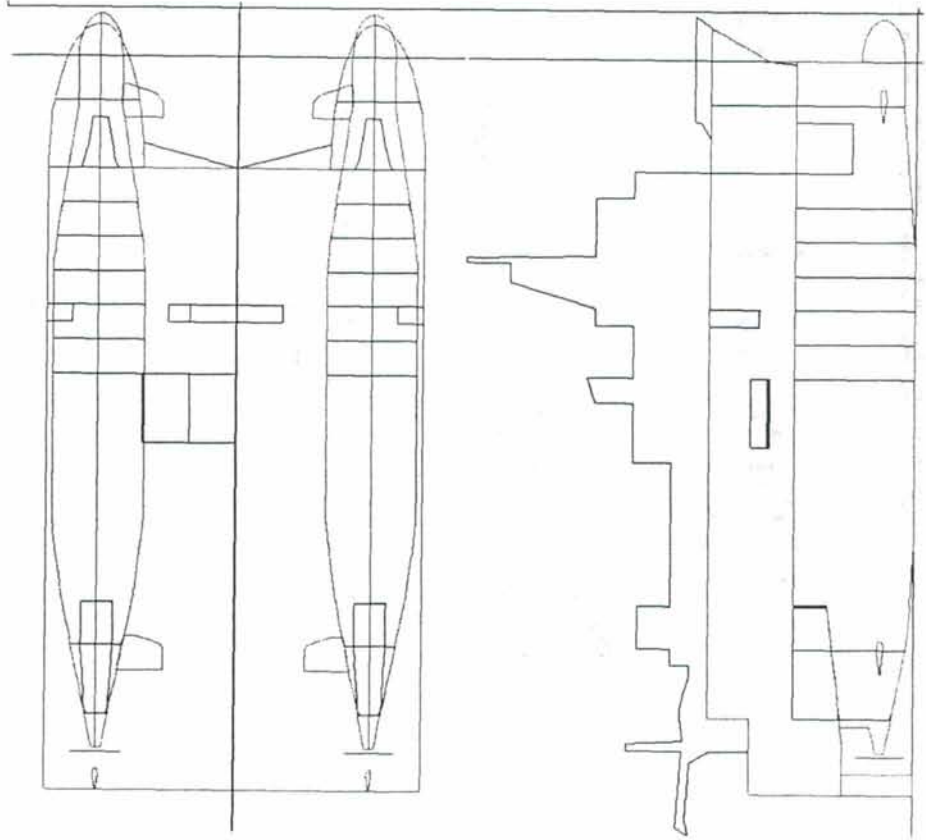


1998 Swath Launch





GHS Hull



Appendix IX



HUGH R. SHARP CAMPUS

University of Delaware
Dares, Delaware 19786-1208
Ph: 302-845-
fax: 302-845-4000

March 15, 2000

Dr. Larry Atkinson
Chair, Fleet Improvement Committee
Old Dominion University
768 West 52nd Street, Crittenton Hall
Norfolk, VA 23508

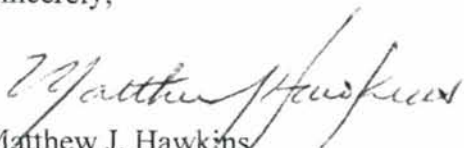
Dear Dr. Atkinson:

I would like to provide the Fleet Improvement Committee with a brief status report of the University of Delaware's progress in designing a replacement vessel for the R/V CAPE HENLOPEN. As of this date, we are on schedule in the design process as outlined in the timetable presented to FIC in November 1999.

The "Delaware Research Vessel Committee" (DRVC) has been formed and the first meeting scheduled for April 10, 2000, in Lewes, Delaware. This meeting will focus exclusively on developing the "Science Mission Requirements" for the new ship. It is our intention to have the completed SMR's to the Fleet Improvement Committee for review and comment by June of this year. Development of the concept design will begin once the SMR's are finalized.

Five extra copies of the preliminary planning package that was sent to the "Delaware Research Vessel Design Committee" (DRVC) are enclosed for distribution to the other members of the FIC.

Sincerely,


Matthew J. Hawkins
Director, Marine Operations

Enclosures

Cc: Carolyn Thoroughgood, Dean
UNOLS Office
Dolly Dieter, NSF
Sujata Millick, ONR

VESSEL MISSION STATEMENT

The principal area of operation will be the Atlantic coastal waters from Long Island, New York, to Cape Hatteras, North Carolina, up to 200 nautical miles offshore, the Delaware and Chesapeake Bays. The vessel may occasionally be required to work as far north as the Gulf of Maine, as far south as Florida, and as far offshore as Bermuda. In short, the vessel must be capable of working near shore, or in the bays and sounds, as well as in exposed offshore waters. The vessel should be capable of operating in all seasons in the mid-Atlantic on a 24-hour per day basis.

The new vessel will be "general purpose" serving all disciplines in oceanography. Scientific payloads will be highly variable and include such items as winches, vans, and itinerant deck loads, such as moorings. The vessel should also have solid lifting and towing capability. As a result, it will be designed with "ultimate flexibility" in mind, such that it can be configured to a wide range of missions, both those currently envisioned and those which may develop in the future. In support of high flexibility, it shall be capable of carrying standard 20-foot portable vans.

The vessel should have excellent seakeeping and station keeping ability, as well as slow speed control. The most modern communication systems available shall be used. Acoustic noise levels (both internal and emitted) and chemical emissions from the ship itself, shall be minimized to levels acceptable to the scientific operations envisioned.

This new vessel will be more modern and capable and, when brought on line in 2006, will replace the R/V CAPE HENLOPEN. New technologies should be explored where possible to meet these requirements. It is the intent of this design process to be as forward thinking as possible so that this new vessel can best serve the scientific community well in the 21st century.

The Delaware Research Vessel Committee
April 2000

Appendix X

Replacement Vessel for R/V *Alpha Helix*
Vera Alexander, Dean, SFOS
February 23, 2000

- Mike Purdy is well aware of these first items. They are included as background reminders:
 - The *Alpha Helix* is the regional research vessel for the University National Laboratory System (UNOLS) fleet of academic vessels. This means, that if her capabilities allow, she supports all academic research in the region. The Oregon State University vessel has been brought up for some work because of limitations due to the *Alpha Helix's* small size.
 - She is owned by the National Science Foundation and assigned to the University of Alaska for operation.
 - We received and upgraded her in 1980. Prior to that she had been operated by the Scripps Institution of Oceanography as a national facility supporting expeditionary marine biology.
 - In the "old" days, the National Science Foundation would have been able either to provide construction funds or to arrange for Navy funds to build a replacement. Today, this seems to be our responsibility.
 - The former head of the Oceanographic Facilities Section, Don Heinrich, was very supportive of our efforts to get a replacement.
 - The *Alpha Helix* has at most six years left of useful life. There are some things that even the best maintenance cannot cure, i.e., the ravages of time and wear. There is tremendous urgency in moving forward.
- Progress to date:
 - The Fleet Improvement Committee (FIC) of UNOLS appointed a group chaired by Tom Weingartner and me to prepare a Science Mission Requirements statement for the new vessel with broad input from potential users. This was done and it was approved by the FIC (January, 1999).
 - The next step is to secure funding for a conceptual design and then for a preliminary design. We probably should not do this until we have a firm idea of the source of construction moneys.
 - The new vessel is to be between 180 and 200 feet in length, well suited to oceanographic research, but also capable of trawling in support of fisheries research. She would have sufficient ice strengthening to operate in the Bering Sea seasonal sea ice throughout the year, but would not be an icebreaker.
- Regarding Senator Stevens and staff:
 - We must get the point across that this has no relationship with our earlier abortive efforts to design and secure an icebreaking arctic research vessel for the United States. That was to be a national facility, possibly operated by us when in the Western Arctic, but not the regional research vessel for Alaska.

