UNOLS COUNCIL MEETING
Wed. Mar. 5 & Thurs. Mar. 6, 2003
Scripps Institution of Oceanography
Martin Johnson House (T-29)
La Jolla, CA

Meeting Summary Report

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Appendices

Call the Meeting: Tim Cowles, UNOLS Chair, opened the meeting at 0830. The agenda for the meeting is included as ***Appendix I***. Meeting participants introduced themselves. The attendance list is included as ***Appendix II***. Tim thanked Bob Knox for his guidance as UNOLS Past-Chair. Bob Knox welcomed the meeting participants to Scripps Institution of Oceanography (SIO).

Accept the minutes of September 2002 Council Meeting – A motion was made and approved to accept the minutes as written.

UNOLS FLEET RENEWAL ACTIVITIES:

Navy Report to Congress on Renewal of The UNOLS Fleet – John Freitag reported on the Navy's report to Congress. His viewgraphs are included as ***Appendix III***. The Navy's report to Congress on Fleet Renewal was signed by Acting Secretary of the Navy, Hansford T. Johnson and submitted to the House Armed Services Committee on 25 February 2003. The report was based on the FOFC Report and the JJMA Common Hull Study. The major differences are in the timing of construction and cost of construction. The JJMA Common Hull Study provided cost estimates for both SWATH and Monohull implementations. The estimated cost of construction for the Ocean Class is $63 M - $80 M and the cost for the Regional Class is $28M - $37M. The low end of the range represents the cost for a monohull and the high end of the cost range represents cost for the SWATH. The timing changes invoked a more realistic timeline from a Congressional funding standpoint. The timeline chart in Appendix III indicates the year the money becomes available for construction.

Admiral Cohen is dedicated to the renewal of the UNOLS Fleet. His POM-04 budget included $80M for Ocean Class vessels. This budget was not included in the Navy's budget request due to competing internal Navy priorities. It is very likely that the Ocean Class request will be resubmitted for the FY06 budget.

While at the present time there are no funds appropriated for UNOLS Fleet renewal by Congress, NSF has expressed a commitment to funding the Regional Class and the Navy has expressed continuing commitment to construction of the Ocean Class.

The Navy report recommends a streamline acquisition process, which could be similar to what was used for AGOR26.

There was discussion about the timeline in the Navy report and concern that there could be some gaps between the procurement of new vessels and the estimated ship retirement dates.

(Q) Should the ship retirement dates be re-evaluated and changed to reflect the apparent shift in new ship acquisition dates? (A) Not at this time.

(Q) Why was the Gulf vessel construction date in the Navy report different from the FOFC report date? (A) The revised date is based on the premise that NSF program funds would be available for fleet renewal by FY 2008.

(Q) Would the FOFC plan be revised to reflect the dates shown in the Navy report timeline? (A) This is up for agency discussion.

John continued by reporting that as part of the JJMA Common Hull study the TAG51 design was evaluated to determine if it could be effectively converted to an Ocean Class vessel. The study concluded that the required conversion would be too expensive. The TAG 51 is a very good coastal, survey vessel, but it is not appropriate for general oceanography.

NSF process for Funding Vessel Construction Efforts - Mike Reeve reported that nothing has changed since the FIC meeting. The NSF FY04 budget request to Congress includes Major Research Equipment (MRE) requests totaling approximately $200 million. The items in the FY04 budget are from other divisions. The MRE items for Ocean Sciences that have been approved by the NSB and mentioned in the FY04 budget request include the International Ocean Drilling Program (IODP) at $76.8M in FY05 and the Seafloor Observatory Initiative in FY06 at $24.7M. The ARRV construction MRE item will be reviewed this summer by NSF to determine if it is to be forwarded to the NSB for inclusion in future budget requests.

The concept for including program funding for mid-size infrastructure in NSF Division budgets has been blessed by the NSF administration and was included in the FY04 request. The FY04 budget request includes $12.5M for development of new deep submergence capability. The FY04 budget request also mentions the plan for increased funding for FY05 & FY06 to support the fleet renewal process.

Summary of Fleet Improvement Committee (FIC) meeting – Annette DeSilva reported for Larry Atkinson, FIC Chair, who could not attend the Council meeting. Larry provided a written committee report, which is contained as ***Appendix IV***. Also contained in ***Appendix IV*** are viewgraphs presented by Annette.

The committee met on January 28-29, 2003. Since the major focus of FIC is fleet renewal, many of the items addressed by the FIC in their January meeting will also be covered in this Council meeting. These items include:

- Agency Reports and Fleet Capitalization
- Navy's Scalable, Common Hull Study
- Bay Marine Inc. Study
- Ship design and improvement projects in progress
- Finalize the SMRs
- Working Group on Ocean Observatory Facilities
- FOFC Long Range Fleet Plan
- KILO MOANA Operations

The FIC added two new members in the fall, Clare Reimers (OSU) and Ron Benner (USC). Bill Smethie rotated off the committee after serving two terms. The FIC Chair position will open in October of this year. The position will be broadly advertised.

Annette showed the FIC Roadmap. As the Science Mission Requirements (SMRs) approach finalization, the FIC is shifting its attention to the next phase of Fleet renewal, which will include development of conceptual designs. The FIC plans to examine the process that was used for AGOR 26 acquisition and identify the pros and cons of this accelerated process. The FIC will work with the UNOLS Office and the steering committees to provide input to the JJMA Phase II effort. The Committee will stay engaged as the agencies develop plans for operator selection and ship construction management. The FIC has reviewed the membership of the SMR Steering Committees. Replacement suggestions have been made for Dennis Hansell for both the Ocean and

Regional Class committees. Matt Hawkins has been added to the Regional Class committee. Marc Willis has been suggested as an addition to the Ocean Class Committee.

Final Recommendations from the Navy's Common Hull Study - Dan Roland (JJMA, Inc) reported on the findings of the Navy's Common Hull Study. His viewgraphs are included as ***Appendix V***.

The purpose of the study was to determine if there would be cost savings by developing a common hull for the Navy's T-AGS vessel and the Academic AGORS. Six different hull forms were developed and sized to meet T-AGS and AGOR mission requirements. The study tasks include:

- Determine Rough order of Magnitudes (ROMs) for the Ocean and Regional vessel designs.
- Identify commonality between T-AGS and AGORs
- Develop Ocean Class and Regional Class construction cost estimates
- Examine feasibility of converting T-AGS 51 and 52 to an Ocean Class vessel.

The study revealed that there is minor commonality between T-AGS and AGORS primarily in mission handling systems and hull mounted sensors. There are significant differences in capabilities in the areas of:

- Speed - maximum, sustained, and survey
- Number of accommodations
- Working deck/lab areas (T-AGS is 2:1 over Ocean Class)
- Habitability requirements (T-AGS are required to meet MSC standards)
- Moon pool (T-AGS)
- Helicopter landing capability – T-AGS (X)
- Mission electronics and communications systems

The study results concluded:

- Resulting platforms are significantly different in size (T-AGS 50% longer and 150% larger displacement).
- A common platform would result in ships not optimized for particular operations.
- A common hull would burden the Ocean Class AGOR with a much larger and more expensive than necessary ship.
- If based on scalable hull, resulting platforms would be poorly optimized for their particular operating profiles and day rates would suffer.
- A common hull is not feasible.

The study provided a cost estimate summary (lead ship in FY04 dollars):

- Ocean Class Program Cost (2400 tons, 220 ft)
  - $63M to $67M for mono-hull

        - $70M to $80M for SWATH
    - Regional Class (1000 ton, 168 ft)
        - $28M to $30M for mono-hull
        - $33 to $37M for SWATH

This includes program and construction cost of approximately 10%.

The Scalable Hull Study was expanded to evaluate the conversion of T-AGS 51 as an OCEAN Class vessel. NAVOCEANO is retiring the T-AGS 51 and T-AGS 52 coastal survey ships. The T-AGS 51 design fell significantly short of meeting Ocean Class mission requirements.

- T-AGS 51 was designed as a coastal survey ship.
- It has no dynamic positioning capability.
- T-AGS 51 has a single screw, geared diesel, and no bow thruster.
- Accommodations for only 18 scientists (vs. 25 required by the Ocean Class).
- The day rate expected to be slightly higher (3-4%) than new OCEAN Class.
- The T-AGS 51 Chine hull form is designed for slower speed.
- Working deck area 300 sq-ft vs. 1,500 required by the Ocean Class SMRs.
- The working deck is not designed to ruggedness or load requirements of the Ocean Class working deck, no bolt grid.
- The T-AGS 51 has no space for vans.
- Lab area 700 sq-ft vs. 2,000 required by the Ocean Class.
- Handling Systems are inadequate.
- There is no suitable over-side or over-stern handling equipment presently installed on T-AGS 51.
- Need to install aft A-frame and side hydroboom (including underdeck strengthening).
- No suitable winches currently installed on T-AGS 51.

In summary, extensive modification of T-AGS 51 would be required to meet even the basic Ocean Class SMRs (DPS, science accommodations, and day rate). Major T-AGS 51 modifications would include:

- New stern aft of mid-ship with new propulsion plant.
- New 20-foot long hull section.
- Add bow thruster.
- Expansion of accommodations and storage areas.
- Converted ship does meet stability requirements.

Dan showed the T-AGS 51 seakeeping performance charts. At Sea State 5 the ship would start to greatly exceed motion limits.

It is not economically feasible to turn a T-AGS 51 into an OCEAN Class; any economically feasible conversion would result in sharply reduced capabilities vs. OCEAN Class SMRs. The expected life of a T-AGS 51 converted ship is approximately 20 years vs. 30 years for a new ship.

Dan continued by reporting on the work that has been done in relation to the Regional Class monohull and SWATH designs. The Regional Class monohull design used in the JJMA study is based on the NEW HORIZON design. A NOAA coastal SWATH design was used as the template for the SWATH variant. These designs were used to examine how well Regional Class SMRs could be met and what the costs would be.

Next Dan briefly described the Phase II tasking for the Common Hull Study. Phase II will include an acquisition strategy analysis. They will develop a selection of acquisition strategies that could be used for procurement of the REGIONAL Class research vessels. They will also try to identify approaches that have the potential for reducing cost and/or accelerating the schedule.

Other elements of Phase II include:

- Refine the Regional Class concept designs to come within the 25M cost cap.
- Effects of tonnage on regulatory requirements and life cycle cost
- Technologies to optimize reliability, manning, and life cycle cost
- Ship specification and other documentation to support acquisition
- Develop the documentation for the Concept Design RFP.

In Phase II, JJMA would develop the information necessary for NSF to draft a call for Concept Design proposals and strategies on how to proceed. There will need to be some level of prioritization of the SMRs as part of the Phase II study. The study is the key to moving forward with both the NSF and ONR acquisition process. JJMA will try to estimate cost savings resulting from multiple ship contracts for a class with realistic time spacing. They will further evaluate hull form choices and common hull issues. The Phase II study has a four-month timeline once started.

Curt Collins commented that he would like to see the concept of a <500 GT ship design be considered for the Regional Class vessel. It was remarked that it appears from design studies and the CHRV effort that the SMRs can be met with a ship of this size. There is concern regarding the increasing size of future vessel designs, "ship size creep." Can the operating costs for these new ships be supported? Perhaps smaller Regional ships should be considered. It was suggested that the minimum SMRs that can meet future should be evaluated.

The Phase II task will begin in March and completion is planned for July (four months). Continual communications between JJMA and UNOLS are planned throughout the process.

Science Mission Requirements (SMRs) – The Ocean Class and Regional Class SMRs were available in hardcopy at the meeting. Tim Cowles opened the discussion by remarking that the draft SMR documents were on display at the UNOLS AGU booth in the fall and there was considerable traffic. Additionally, the draft SMRs were available on the UNOLS website for community comment and some good feedback was received.

Mike Prince continued by reporting on the changes to the document that were made since the January FIC meeting:

- Larry Atkinson drafted a preface to the SMR documents.
- Editorial changes and corrections were made.
- The table of participants for the Ocean Class was corrected to include Dave Hebert.
- Appendices were added to reference sea/wind states and for motion standards.
- The table of contents was expanded to include all SMR elements and make the table of contents dynamic in pdf, Word and online versions.

Tim Cowles stated that the SMRs are meant to be living documents and they can be revised. The documents are intended for use as the foundation for follow-on design efforts.

There was concern that the SMRs are seen as a "dream list" of requirements and it is not possible to fit these all in one design. It was recommended that text be added to explain the purpose and intended use of the SMRs. It should be explained that the SMRs define the range of desired requirements and that priorities would be needed. There was also discussion on the placement of the executive summary. All agreed that it should be moved to the front of the document. It should also be shortened to two pages. It was recommended that both the preface and executive summary include a statement regarding the need for prioritization and that the SMRs are not ship specifications.

Peter Wiebe – Raised a few specific issues regarding the SMR parameters. He will provide his comments directly to the UNOLS Office.

In summary, the following changes are recommended to finalize the Ocean and Regional Class SMRs:

- Executive summary – Move to front of document, shorten, add text to explain that these are not specifications, they define a range of requirements and prioritization would be needed. (Steering Committee Chairs and Mike Prince)
- Preface - Add text to explain that these are not specifications, they define a range of requirements and prioritization would be needed. Jointly sign by Larry and Tim. (Tim Cowles)

The Council approved the SMR documents as final conditional on the incorporation of the recommended changes. The documents will be titled, "Version 1."

Tim Cowles closed by commending the UNOLS Office, FIC, and the Steering committees for their efforts in developing the SMRs.

Bay Marine Inc. Study – Mike Prince presented the findings of the Bay Marine Study. Their full report is included as ***Appendix VI*****.** Bay Marine Inc. was contacted by UNOLS to do a study of the relative cost comparison between a Regional research vessel similar to the CHRV, and one that is larger than the CHRV and thus exceeds the key regulatory

thresholds of 500GT(ITC) and 300GRT(US). This vessel would meet the regional requirements of the FOFC report and the Regional Class SMRs. Bay Marine, Inc. is the Naval architect contracted by the University of Delaware for the design of the CAPE HENLOPEN Replacement Vessel (CHRV).

The CHRV has been designed to fall just under the 500 gross ton international tonnage limit and just under the 300 GRT domestic regulatory tonnage. This design represents a good benchmark for a new vessel that will not be subject to many International Maritime Organization (IMO) regulations and will not be U.S. Coast Guard inspected. The international tonnage regulations do not include any significant exemptions that would allow a vessel with any greater internal volume to be designed that would fall under the 500-ton limit. This means that any vessel larger than the CHRV would be over this limit and would be subject to IMO regulations such as STCW, ISM, etc. A larger vessel could be designed that could be kept under 300 GRT domestic and remain un-inspected but this would be more difficult as the vessel became larger. During the course of developing SMRs for the Regional Class vessel it became apparent that it would be useful to have a better understanding of the initial cost and life cycle costs resulting from crossing these regulatory boundaries.

The study was limited to comparing the CHRV with a vessel that met the SMR and was approximately 160 ft LOA. The report made the assumption that since the CHRV was choosing to meet most of the requirements of an inspected vessel with the exception of manning and that IMO and ABS requirements would supercede the Subchapter U requirements that a vessel that was designed to be over 500 GT international would also be over 300 GRT domestic and would be inspected. The study did not consider an un-inspected vessel over 500 GT.

Some of the principal characteristics of Bay Marine's Regional vessel design include:

- Length Overall = 160 ft
- Beam (Max) = 37 ft
- Depth = 16 ft
- Draft (Full) = 11'-0"
- Displacement (Full) = 720 LT
- Power 2 x 750 KW Schottel SRP 550M Z drives
- Max Full load service speed = 13.25 knots
- Crew = 14
- Science Party = 18
- Science Party (expanded) = 26 (convertible lounge, berthing van)
- Working Deck area (aft of portable vans) = 1036 sf
- Labs (Total) = 1040 sf

The study concluded that the life cycle cost increase would be more significant than the initial construction costs, primarily due to the required increase in manning. The CHRV comes in at an estimated initial construction/program cost of $11.5 million. The 160-ft Federal Regional Vessel comes in at an estimated cost of $16.3 million (this translates to $25M when program costs are added). Both of these figures are estimates only and much

of the estimate comes from empirical data in Bay Maine files. The day rate for the CHRV is estimated at $7461, whereas the Regional Ship is $12,402.

Initial construction/program cost for the Regional ship would be increased mostly due to the increased size and associated increase in power requirements. Initial cost would also be increased by approximately $200k because of the requirement to have double bottom tanks instead of wing tanks. This increase may not be a real difference since double bottom tanks may be desired anyway in order to achieve the endurance and range requirements. Many existing un-inspected research vessels, such as the Cape Class, have double bottom tanks. Other increases in initial cost that are directly related to crossing the regulatory boundaries have to do with inspection and documentation requirements.

The total estimated increase in initial construction/program costs is approximately $5 million and of that it appears that 10 to 15% are due to crossing regulatory boundaries and the remainder is due to the added size of the vessel.

One interesting observation was that if you designed a vessel that was only slightly larger than the CHRV, which resulted in an increased manning requirement due to subchapter U (inspected vessel) status, you would reduce the science capability while increasing the costs. This happens because of the requirements for additional crew, the requirements for single person staterooms and the requirement for a hospital, which all reduce the amount of space left over for science staterooms, lab space and working deck. To make up for that loss, it appears that if you cross the line, you need to make a significant increase in size in order to meet the SMR. On the other hand, many of the "requirements" associated with becoming an inspected vessel are consistent with some of the goals stated in the SMR, such as providing single person staterooms for crew and technicians, increasing habitability, etc.

The Council discussed the findings. The feasibility of designing a ship to be under 300 GT but over 500 tons was questioned. There was concern that by attempting to keep crew size down, service to science would be compromised. It was suggested that the USCG be asked to revisit the regulations. One area they can evaluate is the need for a ship hospital when the ship will contain numerous single staterooms. Further evaluation of the impact of regulations on ship size and costs can be made during the conceptual design process. It was also suggested that study should evaluate the uninspected vessel design that is less than 500 tons and determine how close it can come to meeting the Regional Class SMRs.

Ocean Class Follow-On Efforts – Tim Cowles lead a discussion on the next steps needed to keep the Ocean Class design effort moving. The SMRs will be finalized in the upcoming weeks. The agencies are moving forward with the Phase II effort, which will focus on the Regional Class design and acquisition strategies. Tim asked if a similar effort could be carried out for the Ocean Class design.

From the Navy's timeline, the first Ocean Class acquisition funds are indicated in FY06. R&D funds would be needed by FY04 to be prepared to award a construction contract in

FY06. To keep the project on track, a Phase II effort for the Ocean Class should be initiated soon. Additionally, by beginning this task now, some of the results from the Regional Class Phase II effort could be applied. There may be some overlap of effort.

From an agency perspective, this is an issue that involves funding. Currently construction funds for the Ocean Class are not in the Navy's budget. However, ONR plans to continue with their requests for funds.

The Council recommends that in the interest of preparedness and efficiency, the agencies should be encouraged to move forward with the Ocean Class Phase II effort. Tim Cowles will send a formal letter from UNOLS with this request.

Wilf Gardner raised the issue that if renewal follows the Navy timeline, there will be serious ship shortage in the Gulf of Mexico region. The GYRE retirement date is rapidly approaching. The Navy timeline indicates the acquisition funds for a regional vessel will not come available until FY08. If a construction time of two years is assumed, the ship will not come on line until 2010. Wilf emphasized that the FOFC timeline should be pursued in respect to Gulf of Mexico ship needs.

Other Fleet Renewal Implementation Items: Operator Selections and Construction management plans – It was agreed that it is premature to discuss these items at this time and they will be tabled for now.

Break

On-going Design and Construction Efforts:

Status of CAPE HENLOPEN Replacement effort - Annette DeSilva provided the report on the CAPE HENLOPEN replacement effort status. Slides provided by Matt Hawkins for the FIC meeting were presented. His viewgraphs are included in ***Appendix VII***). The target date for completion of the bid package is March 31st. The final design phase with science review is to follow the yard selection and be complete in late 2003. They hope to begin cutting steel in mid-2004 (Perhaps early 2004). Delivery/Sea Trials are scheduled for 2005.

Projects currently underway include:

- Design details, structure, and systems being completed.
- Motion compensated CTD handling crane and traction winch proposed (Dynacon design).
- NCE: Underwater noise prediction model nearly complete (based on arrangement and machinery lists). FEA of engine room deck in progress.
- Shipyard "Pre-qualification" process started.
- Basic model testing program complete.

The tank tests were completed in early November at Vienna Model Basin (SVA). Improvements made include the addition of a bulbous bow and a stern extension for

improved flow from the Z-drives. Propeller cavitation tests with SVA and Schottel were in late February. The dynamic ship's motion analysis will be conducted by OCEANIC Consulting.

CAPE HATTERAS Mid-life Status - Bruce Corliss provided a report on the status of the CAPE HATTERAS Mid-Life improvement effort. His viewgraphs are included in ***Appendix VIII***. The Mid-life started in October 2002. Major improvements include:

- Renovation of main lab, wet lab, galley, mess, all cabins (science and crew).
- Relocation of deck crane from main deck to 01 deck
- Creation of one 2-person stateroom for science party
- Replacement of HVAC, water piping

Bruce showed a sketch of the ship highlighting the areas that have been modified. A storage area was converted to a 2-person stateroom. This increases the number of science berths to 14. There has already been some interest in using all of these bunks. The stores will go in the engine room. The boiler is not requiring as much space as before the mid-life. There will be an inclining estimate when the modifications are complete.

Bruce reviewed the project timeline. The final engineering drawings were prepared in early fall. The interior work will be done at the dock. The budget for the project is $1,200,000 and was funded by NSF. The project is on schedule and in budget. There was quite a large range in shipyard cost estimates for the work. The ship is scheduled to be back in the water for science operations in mid-June.

Status on ARRV Preliminary Design, Model tests, funding – Mike Prince provided a report on the ARRV design effort. Viewgraphs are included in ***Appendix IX***. The ARRV design committee and consultants held a meeting for preliminary design review in Seattle on 4-5 February 2003 at Glosten Associates. The topics of the meeting included the radiated noise test results and open water model test and make final decisions on the hull design, propulsion and other key elements in the preliminary design.

The open water test results were good and the SS5 conditions will be met. Mike showed charts for sea keeping. Motions are lower than expected and the anti-roll tanks can potentially be removed from the design. They would provide only marginal improvement in motions at the cost of a loss of fuel capacity. However, tank elimination removes the ability of the ship to easily heel in ice.

The radiated noise topic generated a lot of discussion at the design review. The noise characteristics of the ARRV design with the Azipod propulsion system were compared with REVELLE with the z-drive propulsion system. The Azipod manufacturer provided noise specifications, but did not provide an explanation of how these numbers were derived. The ARRV radiated noise results are much higher than the ICES goal. Glosten has looked at ways of masking the noise, but that would contribute to the overall radiated noise. It is predicted hat by replacing the Azipod with z-drives the radiated noise will come closer to meeting requirements.

There was a question on what impact ice would have on the z-drives. Answer - The structure around the z-drives would need to be strengthened. Currently, there are icebreakers in use that have z-drive systems.

There are impacts of changing the design to z-drive propulsion that need to be considered. The length of the vessel would increase. There are some benefits with an increased length. They will be able to accommodate a larger variable science load. Modified lab and deck arrangements are being considered. With this major design change, finalization of the preliminary design is delayed. Glosten needs extra time to incorporate the z-drive modifications. Design changes are expected by the end of April 2003.

Mike reviewed the ship characteristics:

- Length, Overall 226'-0"
- Depth, Hull 28'-0"
- Draft, Design Waterline 18'-0"
- Freeboard, Main Deck 10'-0"
- Science Berths 26
- Science Labs 2,000 ft.2
- Deck Working Area 2,700 ft.2
- Science Storage Volume 8,000 ft.3
- Science Storage Load 100 LT
- Speed, Max. 14 kts
- Speed, Cruising 12 kts
- Level Ice 2.5 ft
- Endurance 45 days
- Installed Power 5,750 hp

PELICAN Mid-life Status – Steve Rabalais reported that the PELICAN is undergoing a mid-life refit. In 1995, support for the refit was requested from the state of Louisiana. In 2001, $1.5 M was received. The mid-life effort includes replacement of all piping and electrical improvements. As the work progressed, it was recognized that the improvements needed were more extensive than originally planned. All of the wiring required replacement. Additional funds in the amount of $300K for the added electrical work was requested and granted from the state. The ships cabinetry is being replaced. All work is being done to USCG regulations. During the mid-life the ship will be extended 10 feet and the height of the A-frame will be increased. The ship will be able to carry two vans. The dry lab size will increase by 200 sq ft. Two new science berths are being added bringing the total science accommodations to 16 berths. A new Dynacon winch is being purchased that will have interchangeable drums and carry 0.5-inch, 0.322 and 0.680 wires. There will be more storage for the marine technicians. A request has been submitted for a new crane. They had planned to be complete by 2 April, but this may slip. The first cruise is planned in the end of April. They are pleased with the yard work.

EWING Mid-Life Improvement Plans - Annette DeSilva reported that L-DEO has been planning for the EWING mid-life refit. Viewgraphs are included in ***Appendix X***. On 22,23 October 2002 a R/V MAURICE EWING Midlife Workshop was conducted. The report of this workshop is now available on the web at, <http://www.ldeo.columbia.edu/Ewing/Home.html>. The Overall Summaries and Conclusions as contained in this report are:

"Key Statements:

* Only a replacement vessel can provide all the desired capabilities for improved 2-D MCS, an effective 3-D MCS capability, and substantially improved general-purpose capabilities.
* Quality of these seismic operations would be substantially improved through increased repeatability of the airgun source.
* In the refit of *Ewing* use of a linear airgun array forces a serious compromise of OBS and general-purpose capabilities (but needs more investigation of alternative deck arrangements).
* In the refit of *Ewing*, without a linear airgun array, there are excellent options for new deck and lab layout.

Recommendations:

- Investigate thoroughly the replacement vessel option because it is the *only* way to get long streamer 3-D, a linear airgun array, and improved general-purpose capabilities."

If EWING refit is the choice, then the following improvements were recommended:

- Optimize 2-D seismics, 12 km streamer, improve source.
- Acquire a high-resolution multi-streamer capability.
- Investigate the handling capability for larger paravanes and reels for 3 x 4 km streamer capability.
- Study mechanisms to improve source repeatability (Would a port side upper deck linear array be workable?).
- Improve over-the-side capabilities and lab layout.
- Dynamic positioning: Highest priority for DP is "Option 4" ($1.05M) with control stand, retractable azimuthing, bow thruster and a stern tunnel thruster. Next highest priority is "Option 4" less the stern thruster ($800k).
- Acoustics: Highest priority is Kongsberg Simrad EM-300. Workshop attendees preferred EM-300 plus EM-120 plus parametric sonar.
- To address increased personnel requirements relating to QA, 3-D MCS, and marine mammal observers further consideration must be given to providing additional berths/rooms.

Mike Purdy plans to go to NSF with the various options in the next month. There is a lot of science that isn't getting done because EWING does not have the necessary capabilities. A replacement vessel is expensive, upkeep of systems is expensive and the

training of crew will cost money. However, decisions regarding the various options need to be made so that upgrade efforts can be carried out.

KILO MOANA: Initial Operations and User Feedback - Annette DeSilva reported that science operations on KILO MOANA began in September 2002 and the FIC has conducted four debrief interviews. These included one chemical oceanography program and three HOTS cruises. The debriefs are intended to evaluate the use of a SWATH vessel for oceanographic research and aid in any decision process of constructing future SWATH vessels and improvements to this platform. A standard FIC debrief questionnaire is being used and it has proved to be a useful tool. Viewgraphs are contained in ***Appendix XI.***

In general, the users are very pleased with the ship. Some common comments include:

- Praise of the ship's stability.
- The ship's labs are very spacious with a lot of storage area (not weight).
- Fore and aft access on some decks is not possible. This was a tradeoff that was decided early in the process, as it was not possible to penetrate the bulkheads.
- Multibeam system is working well.
- The biggest problem on KILO MOANA is the CTD operations. These problems are being addressing by building a moonpool for CTD deployment. As a general lesson deployment of the CTD should not be off the ship's aft end as there is excessive vertical motion. Future SWATH designs should consider installation of moon pools. The KILO MOANA moon pool is about 8 ft square. There will need to be a constraining devise so that the CTD doesn't hit the poolsides.
- Over-the-side operations are different on a SWATH and novel approaches are being developed to accommodate the SWATH features. There needs to be a method for communicating these procedures to the SWATH users. FIC has recommended that the University of Hawaii marine technicians develop a handbook.
- The steep gangplank due the ship's high freeboard is a problem. This hasn't been adequately addressed. Loading and off-loading gear from the ship can be difficult and often requires use of a crane.
- There is noise problem in the aft cabin, however, noise measurements have been taken and they are within the specified standard.
- The SONTEK ADCP does not function. They plan to try it one last time and if it still doesn't work, they will switch to a RDI ADCP unit.

The FIC has reviewed the 2003 KILO MOANA schedule and each cruise has been assigned a FIC member for the science debrief. The ship is in the shipyard now and will resume operations in late March.

The FIC has recommend that NSF and ONR support a proposal to evaluate the ship motion for monohull and swaths. Sea State vs. motion of ship and its impact on science operations should be evaluated. Joe Coburn has initiated this effort.

The FIC has discussed ways to inform the community about the SWATH capabilities. In 2003, KILO MOANA is scheduled to go to the North Pacific and Bering Sea. It is likely that the ship will experience high Sea States. Also, mooring deployment and recovery operations are planned. The FIC is drafting a short EOS article on KILO MOANA's initial operations. Its tone will be fairly positive, but indicate that additional information is needed. After a full year of operations and work in higher sea states, the FIC will prepare a more in-depth assessment. It was suggested that coring operations from KILO MOANA be evaluated and considered during this first year.

Agency Report – National Oceanic and Atmospheric Administration (NOAA) – Jim Meehan provided a NOAA report. In ship news, funding for a third Fisheries Research Vessel (FRV) has been dropped from the FY04 budget request due to delays caused by the Halter shipyard bankruptcy. NOAA still plans to procure the 3rd and 4th FRVs. The surplused Navy's T-AGS 52 vessel LITTLEHALES will replace NOAA ship WHITING as a hydrographic survey vessel. NOAA also acquired a surplused Navy T-AGOS vessel VINDICATOR for coral work in the Hawaiian Islands. This vessel currently has no operating and maintenance money although requested. LITTLEHALES will operate on WHITING's O&M budget and an operating differential is requested to maintain the same number of operating days or more. O&M money is also requested for VINDICATOR which will be renamed HI'IALAKAI (which in Hawaiian means embracing the pathways of the seas.

This year NOAA received level funding for ship operations. NOAA may need to cut 20-25 days from each ship schedule. This is for NOAA ships, but might also apply to charter ships. UNOLS vessels fall into the charter category.

NOAA was directed by Congress to purchase a coastal SWATH vessel for the New Hampshire coastal region. Some funding was provided, but not enough to build the ship.

FOFC Long-Range Fleet Plan – plans for an update? – There have been inquiries into whether or not the FOFC plan will soon be updated to reflect the increased facility demands forecast for support of Ocean observatories. Additionally, will an updated plan incorporate other facilities in addition to ships, such as, aircraft and submersibles?

FOFC has indicated that they may want to incorporate other agencies facility needs in addition to the Academic Research Fleet. Congress would probably want to see a more comprehensive plan. At this time, FOFC has not addressed NOAA ship replacement needs nor the ship renewal plans for the Navy or USCG. There is some concern that the current FOFC plan will be set back considerably if the other agency needs are included. The needs of the Academic Research Fleet will be overshadowed by facility needs of these larger entities. UNOLS will need to stay well informed about these potential changes to the Fleet Plan. The next meeting FOFC meeting is planned for May 28th.

Working Group to address Observatory Facility Needs – In January the Council approved the formation of a UNOLS working group to address Observatory Facility Needs. Alan Chave (WHOI) is serving as Chair of this group. Annette DeSilva provided

information about the working group membership, tasking, and their first meeting. Alan Chave provided a series of viewgraphs that are included in ***Appendix XII***.

The working group includes individuals familiar with the establishment and operation of ocean observatories. The membership list and full task statement is included in Appendix XII. The tasking to the group includes the following major items:

- Identify major observatory-related ship and submergence needs and describe the process that will be used to address these issues.
- Identify the requirements for facility support of ocean observatory systems. This should include requirements for both ships and submergence vehicles.
- What requirements can be met with currently available academic assets (vessels and submergence vehicles), and what modifications or augmentation may be suggested including efficiencies that may be gained through contracts to industry?
- What are the changes in demand for facilities resulting from observatory initiatives?
- Identify the specific observatory needs that cannot be met by currently available academic facilities.
- When are the facilities needed for installation, operation, and maintenance of the observatories?
- Provide suggestions for the management, scheduling and operations of facilities related to observatory infrastructure.

The working group met on February 26, 2003 in Boston, MA. Agenda items included:

- Deep ocean observatory requirements for UNOLS vessels
- Deck handling and mooring deployment/recovery needs
- ROV and AUV requirements
- Mapping requirements
- Coastal observatory requirements
- Vessel characteristics, possible improvements, and recommendations for new vessel designs

In review of the deep water observatories, some of the requirements that have been identified include:

- Heavy lift capability (20000 lbf or more), including both equipment and trained personnel
- Better DP capability in higher sea states
- Routine access to ROVs for all observatory ops

Shipboard handling equipment possibilities were identified ranging from the minimum equipment requirements to the optimal requirements for seafloor cabled observatories.

- Minimal Handling Equipment - Chute, 20000 Lbf Swl Winch and two Capstans (10000 Lbf Each For Handling Soft Line) And Stoppers Applied On Deck.
- Better Handling Equipment - Minimal requirements, plus 20000 Lbf Swl (While Rotating) A-Frame.
- Best Handling System - Those above, plus either 2 Lces Or 2 Cable Drums

Generic equipment needs include capstans/tuggers, grappling gear, hard/soft stoppers, cable splicing gear (several transportainers), and large deck space. A picture of the aft deck of a 'Typical' cable repair ship was presented.

Deck handling and mooring deployment/recovery needs were reviewed. A map showing moored-buoy locations was presented. The map provided locations of the sites that are currently operating or funded, as well as those sites to be implemented during the pilot phase of DEOS. Some of the sites are in high latitudes where high sea state conditions can be expected. Discus buoys, as well as spar buoys are planned. UNOLS vessels currently have the capabilities needed to service discus type buoys. No added handling gear is needed. In terms of ship time, however, there will be much higher demand.

A conceptual drawing of the DEOS spar buoy was presented. Its features and service requirements include:

- Requires servicing once or twice a year.
- The spar buoy is 40 m long and will not fit on a UNOLS vessel.
- For servicing and fueling, the ship and buoy would need to be secure to each other. Fuel spills are a concern during fueling operations.
- Between 20-40 DEOS spar buoys are planned.
- Deployments in high latitude regions are desired.
- The oil industry currently deploys much larger spar buoys and their expertise should be explored.

The working group considered possible solutions to support ocean observatory needs:

- Modify Class I vessel(s) to increase deckspace, enhance size of deck gear, and improve DP capability
- Acquire (either purchase or long term lease) a multipurpose heavy lift vessel into the UNOLS system

The working group reviewed the role of ROVs in support of ocean observatories. The intervention tasks related to the observatory infrastructure should be predictable and well defined with time. As these tasks become routine, the ROV work could be appropriate for commercial contracts. It is predicted that observatories will generate much work similar to conventional vehicle science operations. This type of work is probably best suited to a facility such as presently exists with a science ROV. The ROV issues that still need to be addressed is, is the present ROV capability is sufficient for both observatory and non-observatory needs? If not, how should the facility be expanded? The current ROV facilities are full utilized and the addition of observatory work will likely increase demand significantly.

Ocean observatory mapping requirements were reviewed and the existing commercial mapping tools appear to be adequate for observatory work. However, better access via UNOLS vessels may be needed.

The working group considered coastal observatory requirements. Major requirements can be met with the present facilities. However, enhancement of coastal vessels will be required. The desired features of a mid-size Coastal Research Vessel include:

- Shallow water operations (10m)
- 24 Hour operations (including Marine Techs)
- Sustained operations for several days
- Standard sensor suites that include Met, ADCP, CTD, Bio-optics, Acoustic Mapping
- Broader bandwidth communications with shore that can send data back in real time
- Computer Lab
- Electronics Shop
- Wet Lab
- Deck space for a portable Lab van
- Towing Capabilities (Outside the wake, both sides)

There will be increased demand for these mid-size vessels. Regions that may require this type of ship support include:

- Gulf of Maine
- Middle Atlantic Bight
- South Atlantic Bight
- Eastern Gulf of Mexico
- Western Gulf of Mexico
- Southern California
- Northern California
- Oregon
- Washington
- Southern Gulf of Alaska
- Northern Gulf of Alaska
- Bering Sea
- Arctic Seas

The topic was open for Council discussion. Wilf Gardner expressed concern over the composition of the working group. The membership includes multiple representations by two institutions. The working group needs to be aware of the community needs as a whole. There are other individuals that could be tapped. It was explained that the working group has the expertise required to identify major ocean observatory issues and the needs. Their draft recommendations will be broadly distributed for community feedback prior to making any final recommendations.

BREAK

Scientific Committee for Oceanographic Aircraft Research (SCOAR) – Carl Friehe, SCOAR Chair, reported on SCOAR's membership, first meeting, and future plans.

Committee members include Carl Friehe, Chair (University of California at Irvine), John Bane (University of North Carolina), Charles Flagg (Brookhaven National Laboratory), Ken Melville (SIO, Marine Physical Laboratory), and Daniel Riemer (University of Miami, RSMAS). Three ex-officio members associated with the CIRPAS facility are also on SCOAR: Bob Bluth and Haflidi Jonsson (both from CIRPAS, Naval Postgraduate School) and John Seinfeld (California Institute of Technology).

The Center for Interdisciplinary Remotely-Piloted Aircraft Studies (**CIRPAS**) has been operational for about six years. They have six aircraft including three manned aircraft (a Twin Otter and two Cessnas). Most of their work is in support of ONR programs. The aircraft are in the public use category and they are not subject to FAA certification. They have their own government inspection program.

The SCOAR held their inaugural meeting on February 25 & 26, 2003 at CIRPAS in Marina, California. They reviewed their Committee membership, goals and objectives. They discussed the services to be provided to facility users. This was an organizational meeting. Federal agency representatives including John Freitag (ONR), Jim Huning (NSF - GEO/ATM), Jim McFadden (NOAA – AOC), and Cheryl Yuhas (NASA – ICCAGRA) attended the meeting.

Their initial goals are to distribute through various publications an inventory of available aircraft, contacts, specification links, etc. There are other aircraft facilities that they would like to explore. At this time, aerostats (big balloons) have not been discussed.

They are very excited about being a part of UNOLS. They like the concept of the ship time request form and think that a similar form for aircraft would be useful.

R/V Safety Standards (RVSS) –Tom Althouse, Chair of the R/V Safety Committee reported on the RVSS update. The committee tried to update the RVSS with the new items/regulations that have come along in recent years including STCW and ISM, and ballast management. They did not address new security issues resulting from the events of the last 18 months, but these will need to be included in the next revision. They reviewed the things that were firm. There is a new section expanding the topic of safety equipment. They feel that the document is up-to-date. Over the next year they plan to address some new items and also look at the format. They need to insure that the standards will provide guidelines for the uninspected ships. There needs to be a determination of whether the standards are "recommendations," or are they "mandatory." They need to look at "shalls" and "wills." This has been prompted by the NSF ship inspections. It needs to be clarified for the inspectors.

The RVSS exceeds the requirements for uninspected vessels, but not the USCG requirements for inspected vessels. The RVSS, however, are designed to address the safety issues involving scientific activities on research vessels.

There was a question on hazardous material responsibilities. The RVSS specifies that it is the responsibility of the Chief Scientist.

The RVSS goes through a review every three years. The updated document requires Council endorsement. A Council motion was made and approved to endorse the updated Research Vessel Safety Standards. Editorial changes can follow.

ISM Compliance – Steve Rabalais reported that by July 2002 all UNOLS large ships were required to be in ISM compliance. All met the deadline. Steve has heard from the large ship operators. Dan Schwartz and Joe Coburn indicated that things are going smoothly. WHOI decided to bring all of their ships in compliance. OCEANUS is in voluntary compliance with ISM.

At the last RVOC meeting the issue of ISM voluntary compliance was discussed and the committee voted to work towards bringing all of the un-inspected ships into voluntary compliance phased over the next few years. The UNOLS Office proposal includes a request to support training for internal auditors to help achieve this voluntary ISM compliance. The first step in compliance is a status assessment.

Steve hasn't heard of any reports of science being negatively impacted by ISM.

Tom Althouse reported that the extra hours required maintaining the ISM system by the operator is costly both in terms of staffing and resources. This is the concern of the smaller ship operators. However, Tom Althouse stated that ultimately, ISM compliance is better for science in terms of safety.

Ship Operations Cooperative Program (SOCP) - Steve Rabalais reported that SOCP is an organization of ship operators that works to address programs of mutual interest. The organization includes commercial operators, NOAA and UNOLS. Full membership costs $5K annually and allows participation in decision making and voting. Access to the SOCP publications and training films is also included with the membership fee. The RVOC appointed Paul Ljunggren as their SOCP rep.

Paul Ljunggren is in San Diego attending the SOCP meeting. He stopped in at the Council meeting and gave an update of on the SOCP activities. The SOCP meeting is addressing security issues, both in port and underway. They have a number of work groups. One of the working groups is responsible for filmmaking. These include training films. The SOCP is also focusing on the issue of crew retention.

Marine Mammals and Acoustic Permitting Issues – The Council discussed marine mammal permitting issues and the impact on future operations. Tim Cowles opened the discussion by reporting that over the past few months the issue of permitting has repeatedly been a problem. The EWING cruise was curtailed after reported whale deaths. In the case of the NEW HORIZON, their proposed acoustic work was challenged and the cruise had to be deferred. This has become a troublesome issue. UNOLS would like to minimize the impact of permitting on individual operators and PIs, avoiding major impacts on ship schedules. The Council will have an opportunity for discussion on this issue during both days of this Council meeting. On Thursday the Council will participate

in a discussion of this issue with the Ocean Studies Board (OSB) meeting in Hawaii through a conference call. The floor was open to discussion. The comments, questions and concerns are provided below:

Bob Knox reported that SIO, along with UNOLS, is trying to sort their way through this permitting process. It isn't clear at this time how to proceed. Bob reviewed the NEW HORIZON cruise with Principal Investigator Tyack. Tyack planned to test acoustic marine mammal avoidance equipment during the cruise. The acoustic permitting of the cruise that had been received from the National Marine Fisheries Service (NMFS) was questioned and a court restraining order was issued. The program was cancelled. For a number of days, immediately following the restraining order, the ship was standing by for operations in case the order was lifted. In this case a permit had been obtained, but the process for obtaining that permit was challenged. PIs need to be able to follow a clear set of procedures that when followed, result in a permit that will stand the test of such a challenge.

Tim Cowles indicated that the UNOLS office and NSF have been discussing the permitting process. NSF has expressed an interest in supporting someone in UNOLS to assist with the permitting process. Bob Knox noted that the full permitting process sometimes takes an enormous amount of experience, time and money. He doesn't think that just one person working for UNOLS can do all that is required. Peter Worcester (SIO) commented that the suite of expertise that is needed is enormous. There is a lot of gray area when it comes to the process. A hired expert needs to have a suite of skills including marine mammal law, biology, acoustic sources, etc. Peter has used the services of Marine Acoustics, Inc. (MAI) for this sort of work.

The Navy has also contracted with MAI. They contact MAI very early in the project or cruise planning process. This helps to minimize the impact on the PI's efforts and ensures a better chance for success.

Paul Ljunggren commented that the lead-time required to properly address permitting requirements could be very long. It can take months to submit and process Incidental Harassment Application (IHA) paperwork. Once the paperwork is submitted it needs to be posted for 30 days. Then there is a 30-day comment period. As a minimum, if all goes well, it would take five months. The IHA for the Hess Deep cruise was 90 pages in length.

There is also a concern that more and more active acoustic systems may come under scrutiny, even when they are low power systems in common usage.

Question - How do you determine which programs would require acoustic permits? Answer – Initial screening of programs could be part of the responsibilities of the expert hired for UNOLS. Alternately, a panel or individual could screen projects at each funding agency.

Mike reviewed the draft tasking for a marine mammal and acoustic expert:

National Science Foundation Marine Mammal Plan

Marine Mammal and Acoustics Expert reporting to UNOLS Office
Draft: 28 January 2003

1) Advise and assist investigators and institutions in the preparation of permit applications under the Marine Mammal Protection Act and Endangered Species Act. Maintain database of permit applications originating from UNOLS member institutions.

2) Compile, evaluate for accuracy, and make available to UNOLS member institutions factual information on marine mammals and acoustic sources, including links to other electronic sources.

3) Prepare and provide information written in simple, non-technical language describing the acoustic sources commonly used in oceanographic research with respect to potential impacts on marine mammals. Recommend innovative ways to demonstrate to non-specialists acoustic source strengths and potential impacts on marine mammals. Make information available in response to inquiries from institutions, federal agencies, the press and general public.

4) Act as a liaison between UNOLS Office and NOAA-NMFS and other federal agencies, as well as organizations such as the Marine Mammal Commission, NGOs and ocean industry involved with acoustic sources (e.g. petroleum exploration industry).

Qualifications: Candidates must have strong qualifications in marine mammal research and/or the application of existing laws and regulations, and have competence recognized by agencies (including NMFS) and the academic community.

It would be useful to identify those acoustic sources and concerns that can be excluded from the marine mammal and acoustic permitting requirements. It would also be in the interest of NMFS to have this list. NMFS has been trying to set some reasonable standards.

Mike Reeve questioned whether UNOLS would want to move forward with their plan to hire an in house expert? The time commitment for an in-house expert would likely be full-time. As the work becomes more routine, less time may be required. Peter Worcester indicated that UNOLS would benefit by an in-house expert; however, more assistance would be needed for major permitting activities.

To close the day's discussion, Mike Prince commented that we need to determine if hiring an expert advisory person is an effective step. We need to take a close look at the task statement and if appropriate find a person or service who could fill this role. The agency program managers will need to be involved in the decision process.

Adjourn Day One

Day 2:

Recap Day One - The meeting resumed at 0830 on Day two. Tim Cowles welcomed everyone back and provided a recap of the discussions from the first day of the Council meeting.

Jim Yoder (NSF) joined the meeting and reported on NSF activities.

Jim Yoder reported that NSF continues to move forward with plans for construction of the Regional Class. They are initiating the Phase II study with JJMA. At this time there is no clear acquisition plan for the Ocean Class vessel. They hope that the Navy will be successful in requesting funds for construction of this class.

Jim reported that he attended the CORE Annual meeting yesterday (3/5). Rita Colwell made a presentation to the CORE Board. Additionally, the NSF Division of Ocean Sciences programmatic update was provided as a handout to the Board and is included as ***Appendix XIII***. Some major items of interest in the programmatic update include:

- FYO3 Budget increase of >$30M for ocean science research/education, facilities and technology. FYO4 request is problematic, but they are optimistic.
- *Integrated Ocean Drilling Program (IODP)* begins in CYO3. The RFP Synopsis was released on 4 March to be soon followed by an RFP for "IODP System Integration".
- *Ocean Observatory Initiative (001)* development and planning continues in preparation for MRE funding in FY06.
- Design for *Alaska Region Research Vessel (ARRV)* (an Ocean Class ship) is close to completion. Later this year (spring to summer), OCE will submit internal proposal for consideration by National Science Board and NSF management for MRE-FC funding line.
- OCE is planning release of an RFP later this year to fund concept designs for Regional Class ships (ca. $25M per vessel) leading to NSF-funded construction (process TBD) of 3 ships in 6 years beginning in FY06 using OCE program funds (for midsize infrastructure).
- Along with ONR and NOAA, OCE funded an NRC/OSB committee to evaluate deep submergence needs for research, including the possibility of an NSF-funded human occupied submersible to replace AL VIN. Report expected in fall, 2003.
- Using guidance from NRC/OSB reports, NSF and ONR will promote a NOPP-led initiative for research on the effects of acoustic sources on marine mammals and other marine organisms. In addition to other federal agencies, we hope to engage industry, and possibly NGO, partners in the research program.

Jim briefly discussed the Marine Mammal and Acoustic permit issue. This will be readdressed later. As a group we need to decide on how to proceed. What issues need to be addressed? Should an in-house expert be hired or should we contract for services?

Ocean Studies Board's plans for a Deep Submergence Study – Annette DeSilva reported that the NRC/OSB has been funded to evaluate deep submergence needs for research, including the possibility of an NSF-funded human occupied submersible to replace ALVIN. OSB will convene a committee to conduct the study. Membership of the committee will be made public in late March. There will be a 20-day period for the public to comment on the membership. Patty Fryer is preparing for an ROV cruise on THOMPON and could not attend the Council meeting. She provided viewgraphs on the OSB study and these are included as ***Appendix XIV***.

Specifically, the OSB Committee will be tasked to:

- Assess the continued role of human occupied vehicles in deep submergence science, within the context of current and projected capabilities of remotely operated and autonomous vehicles, telepresence, seafloor observatories, and other non-human occupied technologies;
- Make recommendations regarding the mix of new facilities needed to continue to carry out world-class deep submergence science; and
- Discuss innovative design concepts and technological advances that should be incorporated into any new submersibles to support current and future research needs.

DESSC has provided background information (documents) to OSB for use in their study. DESSC will make efforts to keep the user community apprised of the activities of the committee and encourage input from them. DESSC will continue to keep in contact with the committee and in Patty Fryer's absence (at sea) DESSC members Bob Embley and Tim Shank have been asked to spearhead this effort.

Patty has summarized findings from previous submergence workshops as they relate to this current OSB study. All recommend maintaining an HOV capability. This included nine different workshops or symposia over the last 20 years. A summary table for the recommendations from each was presented at the Fall DESSC meeting and is available on the UNOLS Web site.

At the December DESSC meeting there was a discussion on the replacement for ALVIN. They discussed the general design goals for a new HOV, relative merits of HOV/ROV, and the desired depth capability of a New ALVIN. Some of the desired capabilities that could be designed in a replacement for ALVIN include:

- Greater speed
- Improved science sensors and tools
- Improved maneuverability
- Increased power for propulsion and payload
- Greater endurance and improved ergonomics
- Better visibility and lighting
- Improved navigation
- Improved safety systems
- Improved manipulation ability

- Greater external sample storage and increased science payload
- Better communications
- Improved data collection, logging and interface capability to science instruments
- Depth capability to 6000-7000m (depending on the technical feasibility and cost-benefit analysis)

Some of the HOV benefits include:

- Engagement of the operator
- Visibility in 3-D
- Maneuverability/reliability
- Unobtrusiveness
- Capacity for outreach, education and recruitment

At the Link Symposium in May 2002 a discussion on "Full" ocean depth (11,000 m) vs. ~6500 m came up. In response to the full-ocean depth issue, DESSC recommendations include:

- Concerns regarding effective use of resources
- Current effort is outgrowth of community-wide discussions and workshops
- Maintain the deployment capability from the existing support ship (no major modifications to the ship design, or submersible launch-recovery system)
- Meet the stated needs of the scientific community

Deep Submergence Science Committee Activities – Annette DeSilva continued with a report from Patty on DESSC activities. Her viewgraphs are included at ***Appendix XV***.

The DESSC held their fall meeting in San Francisco on 5 December 2002. The presentations from this meeting are available on the UNOLS website at http://www.unols.org/dessc/desmt212/desmi212.html. The meeting included reports from the NDSF science users, as well as, the NDSF operator. There has been no progress by WHOI in finding a Chief Scientist replacement for Dan Fornari. DESSC recommends that finding an individual to perform this function is critical.

Upgrades to DSL-120 and the new Jason 2 field tests have been completed. The first science programs with Jason 2 have been successful. Jason 2 will be used at 6500 m, its full depth capability, in early May on Patty's cruise.

Patty's viewgraphs summarize the activities of the NASA/NOAA LINK Symposium. She and other organizers of the LINK Symposium have drafted a summary article that has been published in the Marine Technology Society (MTS) Journal. Some of the hoped-for products from the symposium include a web-based inventory of tools and sensors and recommendations for new technologies. A list of new technologies is included in the Appendix XV.

The December DESSC meeting included a variety of educational and outreach reports and discussions. These included:

- REVEL
- NOAA Vents program Dive and Explore
- MATE ROV competition at LINK
- RIDGE outreach including lectureships
- DESSC Outreach:
    - Nontraditional fields (marine archeology and educational efforts)
    - IMAX movie and outreach activities
    - Discovery Channel series

Marv Lilley and Joris Gieskes have rotated off DESSC. Their replacements are Debbie Kelley (UW) and Hedy Edmonds (UT). The next DESSC meeting will held at WHOI on June 11 & 12, 2003

Mike Reeve reported that the currently scheduled release date for the deep submergence IMAX movie is October 2003.

Quality of Service, Post Cruise Assessments – Mike Prince reported on the utilization of the new on-line Post Cruise Assessment Report (PCAR) and feedback received on 2002 operations. His viewgraphs are included as ***Appendix XVI***, which include a series of charts. The first charts show the number of PCARs that have been received by ship since July 2002 when the new form was introduced. The charts also show the response by Chief Scientist, Captain, and Marine Technician. Some are still submitting the old paper forms. We would like to phase these out. Mike commented that the on-line form is available onboard WECOMA and as a result they are getting a strong response from all (Master, technicians and Chief Scientist). In general, the response from the marine technicians has been very low.

Mike reviewed the responses that are received. The ships' personnel received the most positive comments fleet wide. Areas that receive the most suggestions include ship supplied science equipment, ship's equipment and pre-cruise planning. In generally, ratings are positive.

The Council discussed how the forms should be used and their role in the assessment process. It was recommended that a subcommittee of Council be established to review the assessments. Their responsibilities would include evaluation of follow-up measures to PCAR comments. The subcommittee would not take the role of enforcers. Instead the group should work to identify problem areas. They should review the form and the assessment process. Lisa Clough commented that in the HEALY debriefs they are able to identify improvement recommendations as well as action items. The form is a good tool for justifying ship and equipment improvements.

Mike Reeve commented that NSF is very impressed by PCAs. The agency would like to have representation on the subcommittee.

The Council recommended that the subcommittee include the RVOC and RVTEC chairs, Curt Collins, Wilf Gardner, and NSF rep (Linda Goad), and an ONR rep (John Freitag).

UNOLS Wires and Cables – Mike Prince reported on plans for developing a new UNOLS wire and establishing safe working load parameters. His viewgraphs are included in ***Appendix XVII***. In 1999 a UNOLS Symposium on wire and cables was held. There has been little progress since that meeting. We have been trying to address the project by using volunteers and it is difficult to get a real time commitment.

The RVTEC discussed this effort at their meeting and a recommendation has been made to seek paid services to get job done. Mike has included support for the new cable design project in the UNOLS proposal.

A cable project steering committee has been formed and includes Jon Alberts, Mike Prince, Dale Chayes, and Rich Findley. Walter Paul has agreed to serve as the project engineer. A design advisory committee made up of members of the cable user community has been formed and includes Frank Bahr, Tim McGinnis, Carl Matson, Marshall Schwartz, and John Erickson. These people have all agreed to serve.

The cable project goals include:

- Develop and test an improved small diameter electro-mechanical (EM) or electro-optical (EOM) cable for the UNOLS community
- May replace or augment capability provided by current 0.322 "CTD" Cable
- Develop uniform SWL & Retirement criteria for this and other wires or cables
- Increase payload at full ocean depth
- Increase data bandwidth
- Maintain or increase power transmission
- Support multiple operations
- Minimize impact on existing winch & overboarding capabilities

The timeline calls for a 2-year effort. Mike Reeve indicated that NSF is very interested in this effort moving forward.

2003 Icebreaker Plans and Major Issues - Lisa Clough reported on HEALY's operations and 2003 icebreaker plans. Her viewgraphs are included as ***Appendix XVIII***.

The heavy ice conditions this year in the Antarctic required the USCG to send two icebreakers to McMurdo. The POLAR SEA #1 blade on the starboard prop broke off while breaking heavy ice. Fortunately, the HEALY was already on its way south to assist with the breakout. Ice conditions predicted for the next ten years make it very likely that two icebreakers will be required annually to support McMurdo breakout and supply operations.

HEALY is scheduled to return from Hobart and arrive in Seattle in early April. A lot of repair work will be done while on transit and after return to homeport. The ship is scheduled to depart Seattle on 13 June to begin Arctic science operations. Three missions are planned this summer in the Nares Strait, the Chukchi Cap and for SBI

mooring operations. There will be no POLAR icebreakers in the Arctic this summer. A Canadian icebreaker may be used to support the SBI survey cruise.

The future of the USCG POLAR class icebreakers is an area of major concern. There is very little remaining service life for the POLAR icebreaker's machinery plant. Major casualties are now the norm on both ships on every mission. The mission for these two icebreakers over the upcoming years will be some of the toughest that they have faced due to the current ice conditions. These ships are nearing 30 years of operation and will require major refit, however, no Service Life Extension Program (SLEP) funds have been identified as yet.

The SLEP estimate for both ships is $400M. The funds need to be secured by FY07. These funds will compete against other USCG priorities (Homeland Security, the Deepwater ship renewal program ($20B), and Rescue 21, the modernization of the USCG's National Distress and Response System ($800M).

Some alternatives that are being considered to reduce the SLEP cost are:

- Reduce power (75k SHP down to 45k SHP)
- SLEP only one ship
- Put HEALY into the DF mix on a regular basis

A meeting is planned at NSF on March 21st to address some of these issues. It will include representation by NSF, CG, AICC and ARVOC. Agenda items include:

1. Status (ice, machinery, refit/replacement)
2. What can science do to help?
3. What science can be included?
4. How to maximize use of USCG icebreakers for next few years
    - Arctic science
    - Antarctic logistics

A workshop to address the science issues may be planned sometime between May and November.

Lisa will have additional information for the Council after the March 21st meeting.

In other AICC items, NOAA is encouraging international collaboration for Arctic operations. They would like to see Barrow as a port of entry to the US. It is not clear if AICC has a role in the international collaboration issue. Lisa asked for advise from the Council. To make Barrow a port of entry, a Customs office will need to be located in Barrow. This would require money and advance notice. This is an agency issue. If the AICC feels that this would benefit science, they should send a recommendation to the agencies.

Research Vessel Security and the impact on scheduling - Joe Ustach reported on security issues. KNORR is operating in the Black Sea. The ship might return to the US

or move elsewhere if war breaks out in Iraq and the area becomes unstable. THOMPSON will not operate off Vietnam this year due to a lack of a foreign clearance.

2003 Operations and Scheduling Issues - Joe Ustach provided a written report in advance of the meeting. It is included as ***Appendix XIX***. Many vessels lost ship days in 2003 due to a number of factors:

- Acoustic permitting
- Weather
- Clearance problems
- Lack of funding
- Instrumentation availability
- Endangered species permitting
- International political unrest

A detailed account of these lost days is included in Joe's report.

The 2004 scheduling depends a lot on the activities this year. Initial scheduling Letters of Intent are starting to be submitted.

Mission Goals and Objectives – Tim Cowles remarked that the UNOLS mission, goals and objectives are on the UNOLS website < http://www.unols.org/issues2003.html>. He encouraged all to visit them. Mike Prince added that any new input is needed by the time of the summer Council meeting so that the Council can set the goals and objectives for the next year.

Defined Levels of Technician/Instrumentation Support –An RVTEC Subcommittee was established over a year ago to address the issue of technical support services. The group includes Woody Sutherland, Barrie Walden, Marc Willis, and Jean Captain. ***Appendix XX*** describes their activities. Dale Chayes joined the Council meeting via phone conference. He explained that the group has struggled with this issue over the past year. Council suggestions on how they should proceed are needed. The effort continues to get pushed off the table, due to the group member's other responsibilities.

It was remarked that the issue of technical services is one of the most highly commented on items in the PCAs. John Freitag commented that the NSF guidelines are clear on what should be provided in terms of services. The problem is that investigators are not aware of these. The investigators often come aboard and expect much more support.

Mike Prince reported that he met with Sandy recently and Sandy is satisfied with the subcommittee's direction to date, but they need to keep the effort on track.

John Freitag recommended that the subcommittee meet face-to-face and realized that this might need agency support. Tim Cowles added that the membership of the committee should remain as is for now (no science rep addition). They need to find a date that works and address the support that can be provided. The UNOLS Office can help with the coordination of this effort.

Dale noted that other obligations of the subcommittee members always prevail. He asked that the Council make it clear that this is an important task.

Tim summarized the discussion:

- The UNOLS Office will assist in finding a meeting date.
- Mike Prince will determine funding availability.
- The Council will send a letter to the subcommittee.
- Subcommittee members will be asked if they still want to participate.
- Bob Knox will send a letter to his counterparts at the subcommittee institutions asking that they provide the time needed for these people to adequately address this issue.

RVTEC Representation on UNOLS Committees - Dale continued by commenting that RVTEC doesn't have adequate representation on many of the UNOLS committees. They would be better integrated if they were more engaged. The technicians are deeply involved in the operations and safety and should be part of the decision making process. Dale sent a letter to Tim Cowles requesting RVTEC representation on UNOLS committees and working groups.

The Council recommended that RVTEC identify the committees that they should be involved in and also identify liaisons. Dale will also look at the various UNOLS ad hoc committees to determine if RVTEC representation is needed.

Ocean Commission Study – Tim encourage the Council to review draft Ocean Commission documents and provide feedback. The final report has been deferred until September and is expected it to be supportive of academic fleet renewal needs. Various Council members have participated in the Commission study and we have had good opportunities for input.

State Department, Hiring new personnel, LOS status, Procedures – Bob Knox reported that when Tom Cocke retired from the State Department, another person was never added back into the office staff. The need for this additional support had been previously recognized and covered by adding Liz Tirpak to the staff. There is no reason to believe that the workload has diminished in the recent past. Liz Tirpak is providing the necessary staffing for obtaining research clearances, but there are other longer term issues that could be better addressed by having two people in their office. Bob has previously sent a note to Margaret Hayes inquiring into the hiring status, but has not had an opportunity to discuss the issue with her as yet. Knox commented that the clearance process is working for the most part and there haven't been any major problems yet. However, the office would benefit by better coverage so that when Liz is out of the office there is someone to respond to problems and enquiries. Tim Cowles stated that in his role as the new UNOLS Chair he would try to visit Margaret Hayes to discuss this and other related issues.

Summer Council Meeting – Tim requested suggestions for a site and date to hold the summer Council meeting. Denis Wiesenburg suggested that the meeting be scheduled

just prior to the TOS meeting in New Orleans (June 4-6). He offered to host the meeting in Long Beach, MS on June 2-3, if a facility could be arranged. The UNOLS Office will work with Denis to explore this option and notify the Council.

Nominating Committee for Council – Annette DeSilva reported that a Nominating Committee is needed to draft this year's slate of candidates. Details are provided in ***Appendix XXI***. The following Council terms are expiring:

- Curtis Collins (NPS) – Non-operator, first term (NPS status has changed to "operator" with the addition of CIRPAS.
- Wilford Gardner (TAMU) – At-large, first term
- Tom Shipley (U. Texas) – Operator, 2nd term

The Nominating Committee is appointed and announced by the UNOLS Chair. It consists of three members, one from a UNOLS operator institution, one from an institution other than an operator and one from any UNOLS institution.

Tim will appoint a committee in the next few weeks.

BREAK

Marine Mammal & Acoustic Permitting Issue – The Council meeting joined the Ocean Studies Board (OSB) Hawaii meeting's special session on Recent Developments Involving Noise and Marine Mammals by teleconference. Jim Yoder (NSF), Mel Briscoe (ONR), and Roger Gentry (NOAA) provided short presentations on recent developments.

Nancy Rabalais introduced **Jim Yoder**. Jim read his paper, which details the EWING case, permits and the EEZ issue. His paper is included in ***Appendix XXII***.

Jim gave a summary of the EWING case. In spring 2002, LDEO began consultations with NOAA-NMFS on MMPA and ESA permitting issues for all EWING cruises scheduled in CY2003. They also implemented marine mammal mitigation measures for EWING cruises in CY02, beginning with the cruise to Gulf of California in September. On September 24 two beaked whales were reported stranded on Isla de San Jose at a time when the EWING was making seismic measurements approximately 100 km away. EWING suspended operations for about 10 days to assess the situation. When there was no evidence of a link between Ewing operations and the strandings, EWING resumed operations with some precautionary measures. The Center for Biological Diversity filed a motion for a Temporary Restraining Order in Federal Court in San Francisco, which was granted on Oct. 28, 2002. NSF immediately requested that the Ewing cease seismic operations, which it did. A hearing is scheduled for early April.

Both NSF and Lamont have met several times with Roger Gentry, Ken Hollingshead and others at NOAA/NMFS; Office of Protected Resources to discuss MMPA and ESA permits for small take authorizations. This will now be standard procedure for all NSF-funded seismic cruises, with the exception of seismic work exclusively in the EEZ of other countries. NSF will not let NSF-funded operators who are doing seismic work

exclusively in the EEZ of other countries file for MMPA and ESA permits. This issue is being debated and the policy may be modified in the future, but is NSF policy at this time.

Jim discussed some of the measures that NSF is taking to assist in the permitting process:

- NSF is evaluating the possibility of a special panel to evaluate marine mammal safety for each cruise.
- NSF is discussing with UNOLS the possibility of a person to help and advise our investigators and operators on MMPA and ESA permit issues and related activities.
- NSF will fund the costs of obtaining any required assessments associated with the permit process for NSF-funded investigations.
- NSF is considering a "Marine mammal safety panel" as part of the proposal review process.
- ONR and NSF will propose a NOPP-funded research program to study effects of acoustic sources on marine mammals using guidance from NRC/OSB.

Mel Briscoe (ONR) was the next presenter. He began by explaining that at ONR they have a team of people who deal with the MMPA issues. They are trying to do the right thing, but don't always have the information needed. It is a difficult problem.

Mel described the related marine mammal and acoustic activities at ONR:

- They have had a marine mammal program for the last 25 years
- They conduct bio-sonar research (study animals that use sonar)
- Databasing and tagging

The Navy's tag program attempts to monitor the sounds received by whales, as well as, monitor the whales' heartbeat in response to sounds received. Unfortunately, it is difficult to tag whales and more whale research is needed. It is often difficult to find whales, until they are beached. Databases on whale distribution and abundance are poor. Better tools than eyeballs are needed for surveying. Surface radar systems are needed. There is work on aerial detection and on radars underway. The Small Business Innovative Research (SBIR) program is supporting most of this research.

Mel discussed the recent NRC study on Ocean Noise and Marine Mammals. They are comparing the document's recommendations with the areas that the Navy has funded. Some of the NRC recommendations have not been addressed. The Navy has modified funding directions based on the NRC recommendations. Another NRC study in this area is expected. The current NRC report addressed everything related to ocean noise and marine mammals. Some of the items will need more detailed study.

The Navy plans to produce a document to educate the community and teachers on the all issues related to marine mammal protection, acoustic issues, permitting, and preventive measures. They hope to have the NRC committee review the document. They will work with NOPP.

Roger Gentry (NOAA) continued the presentations. He focused his discussion on regulatory issues. The noise issue does not pertain to just marine mammals and turtles. These fall under the Endangered Species Act and Marine Mammal Protection Act and therefore there is a requirement under law to provide protection against the affects of anthropogenic noise. But, they are also concerned about fishes and other species as well. NOAA has been addressing each case individually. It is a long-term problem. They need to evaluate the noise problem to determine the level at which it impacts marine mammals. However, they have been too busy addressing daily decisions. They do not have a good set of specifications and regulations upon which to base their decisions. NOAA is under intense scrutiny in this area and they are sued often. They now spend a lot of time defending lawsuits. Only one person in their office is assigned to process permit applications and there are increasing numbers of permit applications.

A NMFS goal is to try to understand the impact of noise and define the magnitude of the problem. They plan to conduct a workshop to address this issue. They have also convened a panel of experts to draft noise standards. The panel just met last week. This standard will provide guidance to everyone. NMFS is trying to get the seismic community to determine the impact of airguns on marine mammals. They also plan to discuss noise issues with the shipping industry.

Other NMFS needs include:

- An ocean budget for noise.
- Measurements of on-going trends
- Mechanism for making measurements.
- The NRC report indicates the need for a monitoring system – NMFS agrees.
- Information on beaked whales, as these are very elusive animals. A study is needed.
- A lot of information is needed on noise response. There is not enough research on behavior.
- Identify benign noise sources so that permits for this type of work can be excluded.
- Need public education to avoid trivial lawsuits.

UNOLS Council discussion followed. Comments, questions and suggestions are provided reported below:

EEZ issue - Jim Yoder commented that NSF attorneys have determined the NSF position regarding permits in foreign EEZs. After the EWING case is resolved, the foreign EEZ issue can be readdressed. Bob Knox remarked that it wouldn't be long before the NGOs are on the hill to dispute science operations involving any noise sources. He is concerned that NGOs will paint NSF and the community with black hats because of the NSF EEZ stance. Jim Yoder indicated that most of the other agencies are in support of NSF. Also, they would make every effort to act in the spirit of the law and take the same precautions that might be required by a permit.

Permitting Requirements - Denis Wiesenburg asked what requires permitting? Jim Yoder replied military sonars and seismic work would require permits, but not ADCPs or multibeam. Some feel that it is just a matter of time before ADCP and multibeam operations get challenged. There is a fair amount of confusion. A table of benign acoustics would be useful. The results from the panel on noise standards will be useful.

Education - Tim Cowles remarked that the community needs to be educated so that we can move forward. Denis Wiesenburg commented that education is important, and the judges also need to be informed. Yoder remarked that the judge in the EWING case looked at case history and science consensus and came to the conclusion that sound can cause injury.

Requirements and Liability - Peter Worcester explained that the agency supporting the work is supposed to do the initial assessment to determine if there is a need for a permit. If they decide that it is not needed, then the project moves forward as is. This is the internal assessment policy within ONR, but not within NSF. Jim Yoder replied that this summer NSF could look at the funded NSF programs to see which might need an assessment. NSF attorney thinks that this is an excellent idea. There was a question on what criteria NSF should use in making their decisions. The ONR criteria have been suggested. This does not guarantee that there will not be a lawsuit but would indicate due diligence with regard to adhering to the law.

Bob Knox suggested that common operations requiring permits be covered by some sort of umbrella permit. Dennis Nixon has suggested this concept of one "blanket" impact statement. Jim Yoder cautioned that by putting all acoustic operations into one assessment, if it gets challenged, all systems and ships on the list would be affected.

UNOLS Expert proposal - Tim Cowles commented that NSF has offered to support a proposal for a UNOLS expert to provide assistance in marine mammal permitting requirements. The Council needs to provide advice on what should be proposed.

NSF Panel - UNOLS can also make a recommendation for NSF to assemble a panel of experts to review proposals and identify concern areas. Jim Yoder commented that the panel could start this summer by looking at the funded 2004 programs. They could identify calving seasons and provide input on how to adjust programs accordingly.

Operator/PI Response template – Paul Ljunggren stated that when there is a marine mammal concern or lawsuit the PI, and the ship operators can receive hundreds of letters and emails. It would be good for the PI and operator to have a well thought out and accurate response to provide.

Timing – Jim Yoder asked when a permitting assessment is needed for 2004 operations. Paul Ljunggren replied that a lot of time is needed, approximately six months. A

summer (July) panel meeting would be cutting it close for cruises early in the next year.

Potential responsibilities of a UNOLS expert were discussed:

- Assist in the permitting process.
- Provide advise and steer PIs and operators in the right direction
- Improve public perception
- Be a spokesperson
- The person could help move projects along through NSF
- Provide advice to PIs and operators on the level of legal responsibility

If the NMFS gets confidence in the UNOLS expert, additional permitting responsibilities might be added for some projects.

Tim Cowles wrapped up the discussion by stating that NSF's willingness to provide support for a UNOLS expert is a good step. Writing the job description would be difficult. The Council passed a motion to move forward with a UNOLS expert. Mike Prince will contact Roger Gentry to discuss the task statement and job description.

UNOLS will also send a letter to NSF recommending that they consider creating a panel of experts to review proposals for identification of acoustic permitting and marine mammal concerns.

UNOLS Business:

2003 Meeting Calendar – The September meetings dates have been set:

- September 17 – FIC and Ship Scheduling
- September 18 – Council
- September 19 – Annual

Annual Meeting agenda items and keynote speakers were discussed. Major agenda items will include marine mammal and acoustic permits and ice breaker support. Admiral Watkins from the Ocean Commission was suggested as a speaker. Tim Cowles will send him a letter.

Annual Report – Mike Prince reported that it would be distributed very soon.

UNOLS Membership Changes – Lehigh University has indicated that they plan to drop their UNOLS membership. Their one researcher in marine science, Bob Carson, is retiring. Tim will send them a letter acknowledging the change and wishing Dr. Carson well in retirement.

UNOLS Proposal submitted for first year of 2nd grant – Mike Prince reported that the proposal has been submitted. It will go out for review.

Adjourn – The meeting adjourned at 12:48 pm.