

**UNOLS FLEET IMPROVEMENT COMMITTEE MEETING**  
**The National Science Foundation**  
**Stafford I - Room 770, 4201 Wilson Boulevard**  
**Arlington, VA 22230**  
**Wednesday, October 1, 2008 from 8:30AM - 5PM**

**Executive Summary:**

The UNOLS Fleet Improvement Committee (FIC) met on Wednesday, October 1, 2008 at the National Science Foundation (NSF) in Arlington, VA. The new task to update the UNOLS Science Mission Requirements and provide input to the Ocean Class Research Vessel acquisition was reviewed. Steps for finalizing the Fleet Improvement Plan were discussed. Susan Banahan provided an update on the ocean observatory facility projections including their timeline and implementation plans. A special report was provided by Grant Rossignol (Naval Surface Warfare Center) on a study to reduce fuel consumption by improved directional stability on Z-drive ships.

**FIC Action Items (New and Continuing):**

<b>Task Description</b>	<b>Action/Status</b>
<u>Ocean Class Performance Specifications Review</u> – FIC members and other UNOLS representatives will review the Navy’s draft Ocean Class specifications. A phone meeting will be held with ONR and PEOShips to review the UNOLS feedback.	FIC/UNOLS Status - complete
<u>UNOLS Representatives to Ocean Class</u> – PEOShips has requested that UNOLS provide names for a UNOLS rep and an alternate to the Ocean Class design/build project. The FIC Chair has proposed that an advisory UNOLS group also be formed. The group would not meet in person, but would be available to provide feedback to the UNOLS rep as required. Detailed instructions, timeline, and any constraints are needed from PEOShips/ONR.	PEOShips/ONR and FIC Status – waiting for guidance from PEOShips/ONR
<u>SMR Update Project:</u> – Task description on Project website at: <a href="http://www.unols.org/committees/fic/smr/update08/index.html">http://www.unols.org/committees/fic/smr/update08/index.html</a> - FIC members review community survey input - Office will compile FIC input - Update the SMR values and priorities based on the community input.	FIC and UNOLS Office Status – in progress
<u>Fleet Improvement Plan</u> - Update and revise draft document with comments from October meetings. Draft the Executive Summary and circulate for review.	Annette and FIC Status – Draft sent to Council for review.
<u>Science User Debriefs for R/V <i>Hugh Sharp</i></u> – Jim Bauer will draft a standard set of user debrief questions that will evaluate the new technologies of the ship. FIC will conduct debrief interviews with <i>Sharp</i> users.	Jim Bauer (lead) and FIC
<u><i>Kilo Moana:</i></u>	

<ul style="list-style-type: none"> <li>• Contact Sandy Shor to keep abreast of Handling System details.</li> <li>• Draft EOS or other appropriate article</li> </ul>	Dave Hebert - ongoing
<u>Design and Constructions Efforts</u> - Stay engaged in ongoing design and construction efforts (Regional Class, Ocean Class, ARRV, etc.)	FIC
<u>Ocean Observatories</u> – Stay in contact with OOI Office.	FIC
<u>Membership</u> – Solicit nominations for FIC position opening in 2009.	Office and FIC

### *Appendices*

I	<a href="#">Agenda</a>
II	<a href="#">Meeting Participant List</a>
III	<a href="#">FIC Action List</a>
IV	<a href="#">ARRV and Regional Class Update</a>
V	<a href="#">Ocean Class Status Report</a>
VI	<a href="#">Science Mission Requirements (SMR) Update Project</a>
VII	<a href="#">Ocean Class SMR Community Input</a>
VIII	<a href="#">Ocean Observatory Initiative Report</a>
IX	<a href="#">Fleet Improvement Plan Status</a>
X	<a href="#">Load Handling System - R/V <i>Hugh Sharp</i> Status</a>

**Call the Meeting:** The UNOLS Fleet Improvement Committee (FIC) met on October 1, 2008 at the National Science Foundation (NSF) in Arlington, VA. Dave Hebert, FIC Chair, called the meeting to order at 0830 and provided an opportunity for introductions. The meeting agenda was followed in the order recorded in these minutes. The meeting agenda is included as *Appendix I* and the meeting participant list is *Appendix II*.

A motion was made and approved to accept the minutes of the February 2008 FIC Meeting <<http://www.unols.org/meetings/2008/200802fic/200802ficmi.html>> (Cochran/Checkley).

**Review FIC Action/Task List from the March meeting** - Dave Hebert reviewed the FIC action items and their status (see *Appendix III*).

- Fleet Improvement Plan Update – The draft of all chapters is complete. Only the Executive Summary is left to be drafted. Discussion on the findings and recommendations is planned during the Annual meeting.
- FIC continues to stay engaged in vessel design and construction efforts.
- Ocean Observatories – Dave Hebert stays in contact with OOI Office.
- Global Class SMR Update Project - This effort will now be part of the project to update all Science Mission Requirements (SMRs) with a new format.
- *Kilo Moana* Actions – Dave continues communications with U. Hawaii to keep abreast of handling system details.
- Science User Debriefs for R/V *Hugh Sharp* and *Knorr*'s Long Coring Capability – Strategies for proceeding with these items will be discussed during the meeting.

- SMR Update Project - Dave reported that there is a new FIC action item to update the UNOLS SMRs and to provide input to the Ocean Class Research Vessel Request for Proposal (RFP) Development effort. Starting with Ocean Class, the SMRs will be updated with a new format that shows target values, minimum acceptable values, and priorities. They will also work to develop a set of generic SMR items that are common to all ship classes. This action item will be discussed during meeting.

**Opportunity for Agency Comments:**

- **National Science Foundation (NSF)** – Bob Houtman reported that NSF is working on a number of issues including scheduling and fleet size. These issues will have implications on ship operations. Additional information will be reported during the UNOLS meetings.
- **Office of Naval Research (ONR)** – Tim Schnoor has been hired as Bob Houtman’s replacement at ONR. There were no ONR issues to report.

**Fleet Acquisition Efforts:**

**Alaska Region Research Vessel (ARRV)** – Marc Willis reported that the University of Alaska Fairbanks (UAF) is in the period of posting information and design details in preparation for the ARRV Final Design Review (FDR) scheduled for October 20, 2008. Marc indicated that the project is ready for FDR and UAF has addressed in detail the areas where additional information had been requested.

The biggest challenge in the project is the manufacturing long lead-time projected for the z-drive propulsion system. The lead-time is estimated at 36 to 48 months. A ship delivery date of 2014 is projected if the z-drives are to be owner furnished. If the z-drives are contractor furnished, ship delivery would be pushed back to 2015. A decision is pending as to whether or not to have the z-drives be contractor furnished or purchased right away by UAF and be owner provided. Most other lead-time items are between 3-12 months.

The production gears used in the z-drives are the cause of the long lead time. Demand for the gears is high because they are also used in wind turbines. There are only seven machines world-wide that make the z-drive gears.

Matt Hawkins (NSF) continued with the update on the ARRV. (See *Appendix IV*) – The project is currently in Phase I, the Project Refresh. FDR is scheduled for October 20-23. The Panel has been selected and is reviewing the design material. After FDR, the Panel report is expected by November 21<sup>st</sup>. Oral information about the ARRV Project will be provided to the National Science Board (NSB) on December 9-10 and written information will be provided to NSB in March for review in May 2009. If National Science Board (NSB) approval is received and there is a positive FY10 funding assessment, the Phase II shipyard selection and acquisition can begin in May/June 2009. If all proceeds on schedule, Phase III Ship Construction will start in February 2010.

**Regional Class Research Vessel (RCRV)** – Matt Hawkins continued with a status report on the RCRV design effort. His slides are included as *Appendix IV*. The contract for the completion of

Phase I (Vessel Design) was extended through November 2008 to accommodate the reorganization of Nichol Bros. The Dakota Creek/Guido Perla team Contract Design Review (CDR) was held on March 11-12, 2008 and they submitted their final design package on April 30, 2008. The Nichols Brothers/Glostén Team CDR is scheduled for October 8-9, 2008. Nichols successfully emerged from bankruptcy and they are now owned by Ice Flow. Their final design package is due around November 10, 2008.

The RCRV Phase II, Detailed design and construction phase, has been suspended until funding is available (FY 2010 or later). The current cost estimates for acquisition are \$50-60M per ship once fully outfitted. NSF remains committed to the RCRV project. The timing and number of vessels will be dependent upon the academic "Fleet of the Future".

For "closure" on Phase I, the RCRV Advisory Group has been asked to provide an assessment of the Guido Perla and Glostén designs to NSF. This will be an internal document for future use when the project re-starts. In the future there will be the ability to see the designs and decide how they will be used. It was pointed out that the cost for acquisition will increase with delay.

Matt remarked that the UNOLS Advisory team has been very effective. Al Suchy commented that the advisory team was very isolated from the cost information of the project.

Matt concluded by stating that NSF is being very methodical in their process for moving forward. They want to make sure that every thing is in order to give them flexibility in the future.

**Ocean Class Research Vessel (OCRV)** – Chris McDonald (Navy – PEOShips) provided the report on the Ocean Class acquisition effort. His slides are included as *Appendix V*. The project will consist of two phases. Phase I is the Preliminary/Contract Design effort and Phase II is Detail Design and Construction. Chris' slides provide the schedule of events and timelines for the project. The Navy has spent the last year working on the Ocean Class specifications and they hope to release the RFP for design/build teams later in the fall. If all goes on schedule, Phase II award is planned for January/February 2011 with both ships delivered in FY14.

Chris reviewed the proposed strategy for including UNOLS representation in the project. During Phase I and Phase II the Navy requests participation of two UNOLS representatives (one primary and one alternate) to ensure coverage at all design review meetings. During Phase I multiple competing design efforts are planned (at least two teams). Phase II would consist of the one selected design. Continuity of the UNOLS personnel throughout the design process is ideal.

In Phase I, the UNOLS representative would attend design reviews to be held once every 3 months at each Contractor's facility. The rep would assist with review of data deliverables (drawings, plans, calculations) and provide input on science mission systems equipment selections and schedules for installation. In Phase II, the UNOLS rep will attend design reviews to be held once every 2 months at the construction facility. The rep would continue to assist with review of data deliverables (drawings, plans, calculations). The UNOLS reps are expected to be needed by spring 2009.

Next Chris reviewed the proposed plan for the ship operator representation. Once the Ocean Class ship operator institutions are selected (sometime after the start of Phase I), the Navy requests participation of one representative from each operator institution throughout Phase I, Phase II, and Phase III. In Phase I and II, the operator rep would have the same responsibilities as the UNOLS rep. In Phase II, the operator rep would have the additional responsibilities of representing UNOLS and his/her home institution with the on-site Government team at the construction facility during construction of vessels. The operator rep would assist with review of vendor recommended spares listings and commercial off-the-shelf technical manuals. The operator rep would also assist with receipt, inspection, and verification of load-out of spares and equipment, and collaborate with the Government team to develop the Post Delivery Schedule, including Mission Trials.

Chris requested FIC's assistance in recruiting UNOLS representatives for the Ocean Class acquisition effort.

Discussion followed:

- Marc Willis – What is the timeline for operator institution selection? Chris replied that the ship operator selection would be addressed by ONR.
- Dave Hebert pointed out that during the RCRV design effort, the UNOLS advisory team included representation from marine technicians, operators, and science. All areas need to be represented.
- Mike Prince – UNOLS will need to know the exact rules for soliciting UNOLS representatives.
- Chris explained that the Navy is looking for someone who can look at the ship as a whole and provide a single voice. This is a volunteer position.
- Tim Schnoor commented on the operator selection process. The Navy expects to release the RFP for OCRV operators in the early part of 2009. The operator institution selections would be known in mid-2009. A question was asked about whether geography of the proposed operator institution would be dictated in the RFP or used as a selection criterion. The answer is that it will not be dictated but will likely be looked at in the selection. Operators will most likely make the case for their geography in the proposals.
- Al Suchy –How will the lessons learned from the RCRV project be applied to the OCRV acquisition effort. Chris – The Navy made changes to the OCRV effort based on the RCRV. There are many people who are involved with both projects. They always try to learn from the previous project.
- Marc Willis – Has the Navy begun drafting the vessel specifications? Chris replied that the specifications are complete in draft form and are based on the UNOLS SMRs. Marc said that during the RCRV project UNOLS had an opportunity to comment on the RCRV Statement of Requirements (SOR) and it made a big difference. He asked if UNOLS would have the opportunity for review and comment of the OCRV specifications.
- Al Suchy – FIC is in the process of updating the SMRs and establishing the priorities. How will this be applied to the Ocean Class specification? Chris – The Navy has been drafting the specifications in parallel with FIC's efforts and they will be able to use the priorities.
- Mike Prince commented that it would be of benefit if the Ocean Class specifications could be

circulated to a UNOLS review group or FIC. Chris replied that the timeline for finalizing the specifications is short. NAVSEA will talk with ONR to determine if a UNOLS review of the SOR/Spec is possible.

- Marc Willis – In the ARRV project, they realized that there are sometimes problems with the interpretation of the SMRs by the designers/shipyards.
- Al Suchy – The Regional Class advisory group were often asked to make design decisions and felt isolated. Broader input would have been helpful. It will be even more difficult for one person to represent the UNOLS community view in the OCRV effort.
- Rob Pinkel asked if bubble sweepdown is being considered in the Ocean Class design effort. Dan Rolland replied that a lot of effort is being devoted to this item and they are evaluating various options. There will be model studies. Chris added that the goal is to have a flush mount multibeam system because it offers fuel savings and optimal hydrodynamics.

**SMR Update and Input to Ocean Class Research Vessel RFP Development** – Dave Hebert reviewed the SMR project tasking. His slides are included as *Appendix VI*.

The UNOLS SMRs could benefit from updating, re-organization, as well as incorporating lessons learned. Stronger statements about minimum requirements and relative priorities are needed to make the SMRs more effective in the ship design development process. Three key concepts would improve the utility of the SMRs:

- Create an SMR statement of research vessel design principals and requirements (would apply to all classes):
- Class specific requirements
- Establish a relative priority for each requirement.

The details of these concepts are included in the slides.

Dave reviewed the project timeline. The SMR update could have a beneficial impact on the current effort by ONR and PEO-Ships to create the RFP and performance specifications for the Ocean Class design effort. Community feedback over the next couple of months regarding the minimum acceptable values, target ranges, and relative priorities for the Ocean Class SMRs would be useful for their efforts. Finalizing the revised SMRs for the Regional, Ocean, and Global Classes can take place over a longer time frame, but could be completed within a year.

A Project website is available at <<http://www.unols.org/committees/fic/smr/update08/index.html>>. The site includes project documents, project statement, reference materials, and a page to submit feedback.

An Ocean Class SMR Table of Values and Priorities was drafted by Mike Prince <[http://www.unols.org/committees/fic/smr/update08/OCSMR\\_Summary\\_Table\\_091608.pdf](http://www.unols.org/committees/fic/smr/update08/OCSMR_Summary_Table_091608.pdf)>. The FIC reviewed the SMR table during an August phone meeting. Based on the committee comments, the table was finalized and converted into an on-line survey form for community feedback.

Mike Prince reviewed the initial community feedback to the draft Ocean Class Requirements table <[http://www.unols.org/forms/\\_OCSMR\\_FeedbackForm.asp](http://www.unols.org/forms/_OCSMR_FeedbackForm.asp)>. A summary of the feedback

is included as *Appendix VII*. There were 41 responses to the Ocean Class survey. Mike presented a bar chart showing the response by institution. WHOI, URI, and SIO had the largest response, respectively. The community response to berthing had the most disagreement. Mike's summary includes a bar chart for each SMR element showing the number of reviewers who agree, disagree, and had no-comment.

A question was asked if the Ocean Class would incorporate "green" technology. Dan Rolland replied that new environmental regulations are becoming more stringent and the Ocean Class designs will have to comply. Mike reported that he attended an NRC panel on shipboard waste disposal. The UNOLS vessels aren't very innovative when it comes to waste disposal. The cruise ships designs include consideration of waste disposal at the early stages.

### *Mid-morning Break*

**OC SMR Update Project (continued)** – The FIC discussed the next steps to finalizing the SMRs.

The committee agreed that there should be additional community input. Another call for input will be sent to the community along with the tally of the institutional response. The FIC will plan to hold a phone meeting around 15 October to discuss strategies for reviewing the community feedback and incorporating it into the SMRs. Mike Prince will compile the community feedback into an organized summary. Dave Hebert suggested that ONR/NAVSEA join in the phone meeting.

#### Discussion:

- Annette – Have the minimum Ocean Class SMR threshold values been included in the Navy's specifications document for the Ocean Class? Dan Rolland – Yes, however, lab space might be a bit smaller.
- Dave Checkley – How is the text of the SMRs followed by the Navy in developing the specifications for the OCRV? Chris – It will be very close.
- Marc- How is the Navy dealing with underwater noise specifications? Chris – They are addressing underwater noise, but the vessel will not be designed to ICES 209; it is cost prohibitive. The ship will meet sonar self noise.
- Rob Pinkel – Will the ship have anti-cavitating hubs? Chris – Yes.
- Marc – The sonar self noise requirement is limited. There are instruments that exceed the sonar self noise levels. This area needs a lot of attention.
- Al Suchy –There are communication problems associated with having two design teams. The competition between the teams prohibits open discussion.
- Al – Are there time constraints associated with the funding of the Navy Ocean Class ship acquisition? Chris – Yes, the funds must be spent by specific deadlines or the money will be taken away.
- Marc Willis – He cautioned about specifying equipment in the Ocean Class specifications that could be obsolete by the time it is installed. Chris – Equipment refreshment will be included in the specifications.

Discussion returned to the UNOLS Rep for the OCRV acquisition project:

- Al Suchy - There is an awful lot of time and effort involved with being a representative to the OCRV project. It is a lot to ask of a volunteer with no compensation. Al also raised question of whether there would be a conflict of interest if the UNOLS rep is from an institution who is interested in becoming an OCRV Operator.
- If the UNOLS rep is also from an institution selected as an operator, there is concern that the individual would have difficulty representing the interests of the whole community, not just his/her own institution. Also, it would be very challenging to find an individual who would be willing to take on the responsibilities of a UNOLS rep without compensation, unless his/her institution had an interest in the operation of the vessel. Optimally it would be best if the UNOLS rep could come with support.

## ***1200 Lunch***

**Ocean Observatory Projections -Status report on timeline and implementation plans** - Sue Banahan, from the Ocean Observatories Initiative (OOI) Office provided an update on ocean observatory projections. Her slides are included as *Appendix VIII*.

Last year when Sue gave this presentation, the OOI 2007 projections for the NSF/MREFC Capital Investment were \$331M over five years. The operation funding was slated to ramp up to \$50M annually. There was a successful Conceptual Design Review in August 2006. OOI funding was included in the FY 2008 Request and there was a successful Preliminary Design Review in December 2007. The OOI timeline that was presented last year is no longer in effect because of the hold on MRE funds. OOI must go through the Final Design Review (FDR). The project has been shifted back by about two years.

Current OOI Status: The OOI funding profile is absent in the FY 2009 request. The FY2010 funding request is pending a successful Final Design Review (FDR) in November 2008. If successful, OOI will go before the National Science Board (NSB) in spring 2009. Pending NSB approval, construction could start in summer 2010.

The OOI configuration includes three Global scale nodes in the Southern Ocean, Ocean Station Papa, and the Irminger Sea. The sites were selected because of the science that is carried out at those sites. There are five Regional scale nodes in the NE Pacific and Coastal scale assets in the Mid-Atlantic Bight shelf-break (Pioneer Array) and the NE Pacific continental slope (Endurance line). Each scale incorporates mobile assets. There will be cyberinfrastructure to enable adaptive sampling, custom observatory view, and collaborative analysis. There are interfaces for education and public engagement. Descriptions of the OOI sites are included in the slides. The initial location for the Pioneer Array is the mid-Atlantic Bight. The initial site will operate there for 5 years after installation. After that it would be recompeted.

Sue presented the OOI estimated days at sea. Starting in about 2013 and 2014 the OI system becomes operational. Once OOI is operational, the funding for operational support would come out of OCE funds. The estimated days include station, port, and transit time. The transits and ports are based on most convenient ports. Once OOI is installed, the OOI facility projections include 74 Global ship days, 65 global and ROV days, and 32 days for an intermediate ship. Some of the Global Nodes could potentially be serviced by non-UNOLS vessels (*Palmer*,



NOAA ship, etc). OOI is investigating potential ship time sharing arrangements with NOAA for Ocean Station Papa, with European partners for the Iminger Sea Node and with Chile and *Palmer* for the Southern Ocean.

In the period prior to the MRE funding, support for OOI planning has been provided from OCE funds.

**Fleet Improvement Plan (FIP)** - Dave Hebert reported on the status of the FIP draft (see *Appendix IX*). All chapters of the Fleet Improvement have been drafted with the exception of the Executive Summary. The preliminary findings and recommendations will be presented to the membership at the Annual Meeting.

Some minor changes were suggested:

- Add the 2008 utilization statistics to figure 49.
- Revise Figure 54 so that the Ocean Class is listed before the intermediate Class.

Once the draft is finalized, it will be sent to the Council for approval.

### **New Load Handling Systems:**

***Kilo Moana Load Handling System*** – Sandy Shor reported that most hurdles have been crossed. There is a University of Hawaii engineer in Scotland this week meeting with the handling system manufacturer, Caley. They are assessing the readiness of the system for installation and when and how that can be done. The heavy weight of the handling system presents challenges for installation on a SWATH.

**Load Handling System – *Hugh R. Sharp*** - Bill Byam (University of Delaware) sent a written status report on the Hugh R. Sharp’s handling system (see *Appendix X*). Their Caley handling system has been in place since summer 2006 on the R/V *Hugh R. Sharp*. The system is used on all cruises to deploy and recover the rosette and CTD.

The system allows hands free deployment and recovery of the rosette. It has a motion compensating system for ship’s roll and can be telescoped out to distance itself from the ship. On the minus side, there is no failsafe “bring back” recovery system for the winch. There has been difficult dealing and getting upgrades with Caley in Scotland.

### ***Break***

**Reduced Fuel Consumption by Improved Directional Stability on Z-Drive Ships** - Dan Schwartz introduced Grant Rossignol (Naval Surface Warfare Center (NSWC), Carderock Division, Seakeeping Division). NSWC has been working on a project that predicts reduced fuel consumption by improved directional stability on z-drive ships. Grant presented slides (to request a copy of the slides, contact Grant).

For years the Navy has tried to improve the directional stability of the TAGS-60 class ships. These ships have z-drive propulsion systems. Grant slides included TAGS 60 photos. The ships

are 329 feet length overall and have a maximum speed of 15 knots. The Navy conducted spiral and 10-10 zigzag maneuvers evaluate directional stability of the ships and define the problem.

TAGS 60 Class model tests were conducted in support of a planned gondola installation. The Brighton Dam Lake site was used for the model maneuvering tests. It offered a large maneuvering area and very calm conditions. The model length was about 30ft. The model maneuvering tests showed that a skeg was required. Pre-skeg and post-skeg maneuvering trials were conducted on the Navy survey vessel *Sears* to verify model results and obtain preliminary estimates of fuel savings. They were surprised by the results, so the pre-skeg and post-skeg tests were redone on the vessel *Sumner*. The operational areas used for T-AGS 60 Class maneuvering trails were the South China Sea, Mariana Islands, and Philippine Sea. They got very good data from the *Sumner*. The skeg used in the ship trials was 80-feet in length, extended 4 feet below the baseline, and was 2 ft wide. Grant wishes that they were able to experiment with shorter skegs.

Grant explained the term “overshoot.” Overshoot is the amount a ship continues in its forward motion before it starts turning after the command to turn is given. The auto-control works to bring the ship on the proper course. A skeg reduces the steering activity by a factor of 10. The less the steering control has to work, the more savings in fuel and wear on the control system. The auto-control on the TAGS-60 was compensating for the zigzag and as a result the z-drives were wearing out every 30 months.

The skeg was \$70K to install. The skeg reduced the maximum steering angles and levels of steering activity. It reduced the fuel consumption and required power by 27% at 12 knots. A savings of approximately \$45k per month (18% of the total fuel costs) is estimated by using a skeg. There is an anticipated savings in z-drive replacements due to the reduced steering activity. A yearly estimated fuel savings of over \$3M/year for all 6 TAGS 60 class ships offsets the total skeg/test costs of approximately \$1.2M. The skeg would also cut down on vibration.

#### Discussion:

- Dave Checkley –Greater ship stability would offer the potential for better for over-the-side handling.
- Matt Hawkins– Was the problem defined by NUWC before hand? Dan Rolland – Halter Marine defined the problem. Matt- how do you know how big to make the appendage? Grant – Through modeling.
- Grant commented that other z-drive ships may be candidates for improvements. The AGOR 23 class, AGOR 14 class, and NOAA ship Brown are all similar to the TAGS. The costs of the tests are small when compared to the potential fuel costs savings. The testing takes about 3 days.

Grant suggested the following steps with respect to the AGOR ships:

- Conduct a short sea trial to assess the directional stability of the ship – if not major, the skeg installation is not worth pursuing further.
- If worth pursuing, conduct model tests to assess the maneuvering, powering, and fuel consumption of the designated ship.
- Install the appendages on the designated ship

- If justified by the final fuel savings, install skegs on the other AGOR 23 class ships and make a decision on the plan for improvements on the AGOR 14 Class ships. The TAGS 60 Class costs of all appendage modifications and testing are projected to be paid by less than one year of fuel savings (18% fuel savings). If the same savings of 18% is realized for by the AGOR ships, the costs of all appendage modifications and testing are projected to be paid for by approximately 1 year of fuel savings.
- Dave Checkley – Will the Ocean Class designs include the appendages? Dan – the Ocean Class calls for directional stability. It is unknown if these ships will have z-drives.
- Rob Pinkel – Can the autopilot be adjusted to make it more responsive to turning commands? Perhaps there is an algorithm that could be adjusted to relax the overshooting.
- Dan Schwartz suggested that the large ship operators (Bruce Appelgate, Al Suchy, and Dan) discuss this further with the program managers to determine if they should pursue the baseline and spiral tests. Grant explained that the tests must be carried out in calm sea conditions. POS-MV is needed. Then calibration takes a half day. The cost is about \$100k for the initial survey and it takes about 1 week for results.

Grant will send a copy of the slides to Tim Schnoor at ONR.

**Ocean Class (revisited)** – Chris MacDonald said that the Ocean Class Specifications will be released soon, probably by the end of October 2008. He reviewed the conditions of allowing outside review of the specs. If there are any suggested changes to the specifications that would increase the estimated cost of the ship, there would have to additionally be a tradeoff to offset the added cost. The Navy has worked to meet the Ocean Class acquisition budget. Any suggestions from UNOLS must come with a single voice. The Specifications must be final by the end of October. Anyone who reviews the specification must sign a non-disclosure document. Chris requested that UNOLS reviewers do not add anything that is not already in the specification.

Chris proposed that a group of UNOLS reviewers be quickly identified. He will send the reviewers a non-disclosure form immediately. Once signed, the specification document will be sent to the UNOLS reviewers. Chris suggested that there be a phone meeting during the week of October 13 to review the UNOLS comments.

UNOLS will quickly assemble a review group and provide the names to Chris.

#### **Future FIC Activities:**

**R/V *Hugh R. Sharp* User Debriefs** – The FIC members agreed that it would be worthwhile to get user feedback on the new features of the R/V *Sharp*. A standard set of debrief questions will be developed. Jim Bauer volunteered to draft the questions. The *Sharp* cruise list will be reviewed to determine which PI's to interview. The FIC can share the load of interviewing the PIs.

**WHOI Long-Coring System** – The FIC discussed whether or not to carry out user debriefs with *Knorr's* Long-Core users. FIC decided not to do long-core debriefs at this time. They will revisit this topic after 2009 operations are complete.

**UNOLS Vessel Designation** - There was a discussion on the benefits of acquiring the UNOLS Vessel designation.

- Al Hine asked if there is a benefit of Local vessels being UNOLS ships. Reply - The benefit of the local ships being UNOLS vessels is that their cost for use does not show up in the NSF science proposals.
- Sandy – Are Local ships in the UNOLS fleet needed?
- Mike – We should determine what portion of the small ship fleet is funded by federal funds. There are some.
- Rob Pinkel – it is comforting for the scientists to know that they are going on a UNOLS inspected ships.
- Nancy Rabalais – She really sees the benefit of her institution’s ship being a UNOLS vessel. The ship operates in deep waters. It is fully subscribed.

**FIC Membership changes** - Clare Reimer’s second term on FIC ends in January 2009. We will announce a call for nominations. A nominee with a research discipline in geochemist is desired.

**Meeting Adjourns** – The meeting adjourned at 5:30 pm.