

**UNOLS Fleet Improvement Committee Meeting
Tuesday, December 18th, 2018**

Location:

National Science Foundation - Room 2010
2415 Eisenhower Avenue
Alexandria, VA 22314

Meeting Minutes

Appendices:

I: Participant List
II: NOAA Report
III: Vessel Service Life End Dates and FOY
IV: Over-the-Side-Handling-Systems – Rapp/Triplex
V: Update on R/V Thomas G. Thompson’s Power Quality Issues
VI: Science Mission Requirements for Global Class Update
VII: Recommendation for SMRs Regarding Marine Seismics

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Introductory Remarks, Meeting Logistics, and Introductions – Jim Swift, FIC Chair, called the meeting to order at 8:30 am. He outlined focus areas for the day, and provided opportunities for introductions. The link to the agenda can be found [here](#), and the participant list can be found as [Appendix I](#).

Agency Reports – Each agency reported on their budget status and projections, announcements, and agency initiatives.

Navy – Tim Schnoor provided the report. There were no slides.

- *Kilo Moana* is getting a new CTD system; they are replacing the entire Cauley system. Bids have started now.
- *Armstrong* is undergoing its 5-year INSURV inspection.
- Following the NOAA model, the Navy is considering an ABS end of service life inspection. This will apply to the AGORs and *Kilo Moana*. ABS examines the hulls, and then estimates how long the hulls will last. They are gathering information for how much the evaluation will cost. Anita Lopez had prompted this to be done and it may be a consideration for all ships. Stephen Barry remarked that for the NOAA ABS ship inspections, there were several visits, but they didn’t require a dry dock.
- Zoltan Kelety continued the report with an update on the plans for R/V *Revelle*’s mid-life period. The concentration of the mid-life focus for *Revelle* has been power and electrical, but they have a lot of improvements planned including bow thruster, gondola, sonars, etc.
 - *Brian M.*: Will the gondola hamper port selections? *Zoltan K.*: It isn’t trivial; they will have to be more conscious of tides. They will need to do maintenance dredging at the SIO pier. The gondola will have an impact on the fuel efficiency.

- *Tim Schnoor*: we will add the TK80.
- *Greg Cutter*: In addition to the gondola, will you add space? *Zoltan K.*: The exercise room will be lost but will likely be moved to the office space. *Tim Schnoor*: *Armstrong* made a terrific workout room.
- *Jim Swift*: It is so good to see the improvements to the larger ships.

NOAA – LCDR Stephen Barry provided the report. The slides can be seen as [Appendix II](#).

- LCDR Barry reviewed NOAA activities and NOAA ships
- There have been a variety of NOAA & UNOLS partnerships over the past year. Examples include meetings, ship scheduling, UNOLS ships utilizing NOAA piers, and the civility video.
- NOAA fleet highlights in FY18 included:
 - Achieved 84.5% DAS
 - 50th anniversary celebration
 - Successful start of ASPIRE project
 - Hydrographic survey work in the Arctic and off Puerto Rico
 - Completion of *Ronald H. Brown*'s worldwide expedition.
- NOAA fleet initiatives in FY19 include:
 - Increased day at sea excursion
 - Expanded and focused planned maintenance
 - Enhanced focus on training for shipboard birthday
 - Initiation of respectful workplace training
 - Consolidation of all NOAA acquisition
 - Stephen reviewed the President's budget fleet allocation plan (FY19). It is a busy slide. Gray bars are fisheries work. Orange is OER.
 - NOAA's funded programs on UNOLS vessels was highlighted.
- Fleet Recapitalization plan includes acquisition of an AGOR variant that is similar to *Armstrong*. They will have the source selection through FY2019 Q2. The AGOR Phase I contractor selection will take place approximately one year following completion of the source selection.
- Discussion:
 - *Jim Swift*: Is crewing different on *Brown* as opposed to a UNOLS global? *Jeff Peter*: No.
 - *Stephen Barry*: RDML Gallaudet has been very supportive of fleet recapitalization plans.
 - *Jim Swift*: NOAA wasn't planning on a mid-life for *Brown*, is that still the case? *Stephen B.*: Yes, it will be more like a staggered refit. If they were able to come up with a better way to address the refit, he would guess that they would try to do that.
 - *Jim Holik*: Larry Mayer was on *Okeanos Explorer*. NSF is funding him to collect data to characterize the source of multibeam systems. NOAA provides the ship and NSF is funding the signature characterization. *Stephen B.*: *Okeanos Explorer* has done a lot of great things with its multibeam; they always have their multi-beam on.
 - *Annette DeSilva*: Have the NOAA ABS assessments been complete and are the results available? *Stephen B.*: The assessments are complete, but they are carefully

reviewing the results. The plan is to release it, but they want to be sure it is fully understood.

- *Rose Dufour*: She congratulated NOAA for recovering the Dutch benthic lander.
- *Rose D.*: NSF will put two programs on the *Brown* and they will exchange money because barter is unavailable.
- *Annette D.*: Can you elaborate on the shipboard training? *Stephen B.*: The training is always difficult to maintain. In response, NOAA has protected seven days for each vessel with dedicated time training. It can take place dock-side or could be underway. This training is not to be confused with calibration, and there could be drill scenarios, rescue boat training, etc. The idea is that it is dedicated training time.
- *Rose D.*: Another activity involving agency cooperation is that the academic research fleet (ARF) is sending 4 people to NOAA's environmental training course.

NSF Report – Lisa Clough provided the report. There are no slides to go along with the presentation.

- The budget is unknown at this time. NSF is subject to a potential shut down starting at midnight on Friday (12/21)
 - Bob Houtman is essential and will be on email for urgent matters regarding safety.
 - Related to the budget, is NSF's Big Ideas opportunity. The Big Idea on [Mid-scale Research Infrastructure \(MRI\)](#) may be of interest to FIC.
 - Brian Midson is a program officer on the Big Ideas Mid-scale RI-2 projects. RI-2 projects are funded in the \$20-\$70M range each. Mid-scale RI-2 supports implementation of projects that comprise any combination of equipment, instrumentation, computational hardware and software, and the necessary commissioning. Projects may also include upgrades to existing research infrastructure.
 - Mid-scale RI-1 projects are funded in the range of \$6-\$20M. Mid-scale RI-1 "Implementation" projects must directly enable advances in fundamental science, engineering or science, technology, engineering and mathematics (STEM) education research in one or more of the research domains supported by NSF. Implementation projects may support new or upgraded research infrastructure.
- Discussion:
 - *Lisa C.*: For mid-scale infrastructure projects, she expects that MRE-FC type reporting will apply and they anticipate a strong interest. For new infrastructure projects, the operating plan must be provided. There won't be a new pot of money for the operation.
 - *Brian Midson*: The RI-1 can fund development of project plans.
 - *Lisa Clough*: There will be OOI expansions proposed as a project, which will impact ship use.
 - *Suzanne Carbotte*: What about seismic? *Lisa Clough*: Yes it could apply, but she cautions about the project management and audits.
 - *Jamie Austin*: The big fear is that Congress could pull the funds from year to year.
 - *Lisa C.*: The new money is the \$300M plus up from FY18 and they expect to get it again.

- *Annette D.*: What is the selection process? Proposals can vary a lot. *Brian M.*: There will be discipline reviews.
- *Lisa Clough* continued by reporting on the civility at sea activities. This is at the top of everyone's mind at NSF. NSF, NOAA, ONR, and UNOLS are working on the 'welcome aboard' videos. NOAA will release Module 1 on January 1st. NSF, ONR, MTS, and UNOLS are working on Module 2. This is a major emphasis and NSF is putting in a lot of effort on this.
 - *Rose D.*: The Module 1 video was shown at the IRSO meeting and as a result NERC will now show it on their ships.
 - How do we let the ship operators know about the video? Reply – A message from Navy and NSF.
 - *Annette D.*: At the AGU panel plenary, there was a panelist from South Africa who has made the topic of civility a part of their daily report.

Update Fleet Improvement Plan – The FIC reviewed the Fleet Improvement Plan (FIP) document that is on the Google Drive. The discussed their suggested revisions to the document. Some of the suggestions were incorporated into the draft update during their discussion.

- Dialogue/ comments –
 - *Annette D.*: After the FIC finalizes their draft update, it should be submitted to the Council for endorsement.
 - *Jamie A.*: Should this be referred to as the Academic Research Fleet Improvement Plan? Answer – Yes.
- **Action – each FIC members should contribute updated references to the document.**
- Annette will update the FIP with the general suggestions based on FIC's review/discussion.
- Training and Education:
 - Jamie suggested that a statement about training be added. He will draft it.
 - The plan should address science, training, and education
 - *Jamie A.*: training and education should be shown on the chart
 - *Tim Schnoor*: FIC should recommend/advocate for training and education. Decide how much utilization should be devoted to Training and Education.
 - *Jamie A.*: we can state an aspiration for training; there is a need to augment the training with specific designated cruises. Jamie will write a paragraph.
- Alice Doyle will update Table 2
- There was a lengthy discussion on utilization
 - *Annette* reviewed the projected service life end dates and utilization statistics. See [Appendix III](#). Resolution on the definition of the Full Optimal Year (FOY) is still needed.
 - *Jamie A.*: The message is that additional support for operations is needed, this is happening.
 - Explain the categories of ship operations
 - Explain the constraints of the operations budget
 - *Rose D.*: Improving what we have is important, but not everything needs to be improved- some things work well.

- One way to keep healthy fleet is by right-sizing to match the budgets. This has been a focus over the past years. *Annette D.*: We can state in the text that the agencies have worked to right-sized the fleet to match budget constraints.
- *Jamie A.*: Draft a paragraph on how the ships are used, including percentage of use for science, outreach, etc.
- *Byron B.*: Suggested that a graph be made that normalizes the utilization data.
- The FIP discussion was be continued in the afternoon.

Lunch break

Over-the-Side-Handling Systems – Fin Moore, from Rapp/Triplex reported on the over-the-side handling system (OHS) capabilities installed on R/V *Sikuliaq* and planned for the RCRVs. His slides are available at: [Appendix IV](#). The slides cover the following topics with FIC discussion inserted:

- R/V *Sikuliaq* – Scope of study
- Oceanographic Traction Winch System
- Hydrographic Winches
- Pentagon PLC Control and Monitoring
- CTD Overhead Launch and Recovery System
- RCRVOHS SSV Scope of Supply
 - The lay-out was presented
 - Oceanographic Winch System
 - Hydrographic winch system
 - They are planning for work with EOM cable as well as synthetic rope.
 - Portable winch
 - *Jim Swift*: Why was .393 wire indicated? *Marc Willis*.: They elected to go with a more capable wire.
 - *Rose D.*: Appendix A is about longevity of the wire.
 - *Fin M.*: in the specifications it indicated a dedicated wash and lube system. *Greg C.*: This is not the same for synthetic, right? *Marc W.*: This would only be for the wire rope systems. *Ethan R.*: The synthetic rope is not metallic, so it doesn't need to be cleaned because it will corrode.
 - There is some question of whether cleaning will be needed or not
- Stern A-Frame
- CTD Davit and Supporting Systems
- Portable Side A-Frame
- Main Crane
- Portable Crane
- Control Systems and Strategy
- Other OHS supply equipment.
 - *Greg C.*: Will the sheaves be composite? *Marc W.*: They just resolved this with Rapp. They will use nylotron for the sheaves and will use different ones for the wire ropes.

General Discussion:

- *Ethan R.*: At the last meeting, Jim prompted us to learn more about the future of wire systems. What he sees is the innovation, is the full integration of handling systems with the ship design. There is much more automation with the new systems requiring less manual hand-on operations. When there are accidents at sea, it often involved the complexity of the system. The automation and integration reduces the manual operation tasks and makes it inherently safer.
- *Jim S.*: He requested that Ethan provide this statement to FIC so that it can be added to the SMRs.
 - *“Post Meeting note: Ethan’s provided his statement:*
For the next generation of overboarding systems, there should be an emphasis on control and monitoring integration between winches and handling systems (A-frame, crane, boom). This type of automation is achieved with an electronic PLC that has custom software written for purposes of HMI complexity, increasing safety during operations, and achieving necessary science goals. We will continue to see the concept of these "hands-free" systems evolve in the next few years.”
- *Jakob N.*: The Rapp/Triplex technicians will go to the RCRV commissioning activities to ensure that the systems are operating properly.
- *Jim*: Service contracts, we haven’t had them in the past, but it seems like this is something that they would like to do. *Fin M.*: Yes, it is a different department, and they would like to do this.
- *Ethan R.*: Rapp/Triplex have a virtual reality demo of their handling systems. This was featured at the 2018 INMARTECH Symposium in October.
- *Zoltan K.*: Have they done factory acceptance tests yet? *Jakob N.*: Not yet, they will do it in March. *Zoltan K.*: Factor in the drops along the line.
- *Greg C.*: Having the winch operator on deck is key.
- *Zoltan K.*: One of the challenges that they face is the weight variance between packages. He doesn’t think that their CTD OHS could handle this.

Update on R/V Thompson G. Thompson’s Power Quality Issue – Doug Russell provided an updated on the voltage notching issue. His slides are available as [Appendix V](#).

The slides include information on the:

- Timeline – Starting with completion of the mid-life refit in December 2017.
- Problems were encountered during transit to New Zealand and the Brothers Volcano Cruise. Doug noted that the problem happen on *Revelle* and *Atlantis*.
- Ockerman’s assessment on Voltage Notching is detailed in the slides. One of the main disadvantages of DC drives is notch phenomenon.
- A fix is to install lineators. Fourteen are needed and Some of these are very big.
- They have prioritized the lineator installments. They looked at the science that is planned on the ship to come up with a strategy for installing the lineators. They will need to let the science parties know about this in advance of their cruise to prepare adequately.
- Outcomes/ future: Five lineators are now installed. Six lineators will be installed in June 2019. They will develop guidance/specifications for science parties bringing electrical gear onboard.

Dialogue/ comments –

- *Jim Swift*: In looking at future vessels, we have to pay attention to power quality.
- *Revelle* and *Atlantis* are taking a different approach.
- *Ethan R.*: *Sikuliaq* is ACAC ship and it doesn't have a super clean 480. It needs to be addressed during their cruise planning. Users are thinking about the filters that are needed for their science.

Science Mission Requirements for Global Class – The Global Class subcommittee includes of: Greg Cutter (chair), Jim Swift, Clare Reimers, Suzanne Carbotte, Byron Blomquist, Zoltan Kelety, and Ethan Roth. Greg Cutter gave the presentation, and his slides are available at [Appendix VI](#).

Greg reported that they have been gathering data on other Global vessel characteristics. They have conducted a Town Halls at the Ocean Sciences meeting and at the 2018 Fall AGU meeting. A community survey was conducted and there were 118 responses. Another survey was just completed for captains, engineers, technicians and operators.

Dialogue/ comments –

- *Jim Swift*: We are finding that the community is happy in general with the Global Class ships that we currently have.
- *Jamie* asked about the Early Career Scientist involvement in the survey. Answer – It has been minimal.
- *Suzanne C.*: At last week's AGU Town Hall, there was the suggestion to have a targeted Early Career Scientist survey.
- It was suggested that IT, sonar and other technical groups should be involved with new vessel planning from the start.
- *Jim Swift*: We try to be as inclusive as possible since we never know where the best ideas will come from.
- *Tim Schnoor*: On slide 8, in regards to the second bullet “almost all said science was the main driver...” Today, a major driver seems to be OOI and this is work that contract vessels can do.
- The 2018 fall AGU Town Hall had about 25 participants.
- *Jim Swift*: Has tech support groups factored into the SMRs feedback? The systems are more complex and additional technical support would be valued.
 - *Doug Russell*: It will impact the berthing. We also need to think about the operational features.
 - *Ethan R.*: we have been seeing the presentation from Bruce Appelgate on the Zero-X ship. He has commented that the crew will be replaced by highly technical expertise.
 - The USCG has a position for tech expertise; it is not required now, but might be sometime.
 - *Jamie A.*: The autonomous vessel operations will increase demand for more technical people.
- *Greg C.*: Although the funding for new Global vessels hasn't been identified, we should have the SMRs ready to roll.
- Community input – Greg said that they still need to review results from AGU Town Hall and from the operator survey.

Recommendation for SMRs regarding marine seismics –Suzanne Carbotte and Jamie Austin provided the report. Their slides can be seen as [Appendix VII](#).

Suzanne reported on the activities of the MSROC and NSF regarding replacement of *Langseth* seismic capabilities. The activities include:

- Seismic Working Group (SWG) White Paper
- NSF – IDEAS lab meeting at FMMS March 20-21
- Winter 2020 community workshop (like OBSIP workshops)
- Compilation of international capability and contacts
-

Required capability identified in the SWG doc are:

- Installed compressors
- Capability to support a tuned linear surging array 6600 in 3 source
- 12-15km lying streamer
- Streamer birds
- Data logging and navigation

There would be no 3D capability. There are fewer than one 3D cruises a year.

Discussion:

- *Jim*: How many of the systems does the community need? There are a lot of people who don't understand this, does the report lay it out in lay-man terms?
- Only *Langseth* can do what is outline above
- *Joan B.*: she doesn't understand, if they are getting rid of *Langseth*, then how is this going to happen?
- *Jamie A.*: it wasn't a deficiency on the *Langseth*, it was NSF's decision.
- *Jim*: So if you wanted all of these characteristics, then they would have to expand the vessel so that it can also provide general purpose service.

Suzanne presented the SMR survey summary. There many comments on the need for enhanced coring capability.

Suzanne showed images of the current seismic system on *Langseth*. It was clear that this wouldn't be portable. Moving it would be very difficult.

Discussion:

- *Joan B.*: What did the community do before *Langseth*? *Suzanna C.*: They used *Ewing*.
- *Annette D.*: I was confused by acquiring a "cheap seismic vessel." *Suzanna C.*: Yes it is cheap because of industry downturn and was suggested as an opportunity. It is larger than *Langseth* and could allow for general purpose operations.
- *Jim Swift*: One way or another, it has to be addressed in the Global Class SMRs. This is a worthwhile discussion. Can international collaboration be considered? R/V *Sonne* is a very capable platform.
- *Suzanne C.*: The seismic capability it needs to be in SMRs.

Progress on Polar Research Vessel SMRs by the OPP/AC Subcommittee on the US Antarctic Program's Research Vessel Procurement – This was presented by Jim Swift. There are no slides to accompany the report.

- The polar SMR committee is well along in their work and expects to have a document in the next few months. Once they have approval, they will share it with the rest of the community.
- They have completed Polar SMRs as well as the recommendations regarding one ship versus two ships.

Draft SMR Document

- We looked at the Ocean Class SMR document: <https://www.unols.org/document/ocean-class-research-vessel-science-mission-requirements-2007>
- It was agreed that it could be used as the template for the Global SMRs.
 - *Jim Swift*: For the Polar project, they used 85% of the Ocean Class SMR document as a template and it was a very good document.
- *Ethan R.*: If we can overcome the bandwidth issue, it will be a game changer. More operations could be carried out from the shore. If the bandwidth is available 25 years from now, it will be very different.
- *Armstrong* changed it launch and recovery system to support OOI
- *Greg C.*: The subcommittee will draft version 1 and then circulate it to the full FIC. Then we will create version 2 and if comfortable, provide it to the Council for consideration.
 - We will word to make it a living document.
 - We need to think about a reasonable period for review.
 - There could be a comment section
- *Greg C.*: The subcommittee will make the first cut draft. Greg offered to work on the document initially. The first draft is due by mid-February
- It was suggested to have regular teleconferences.
- *Suzanne C.*: will the survey results be posted? It would be very good to capture the results.
- *Annette D.*: The survey and results could be an appendix to the SMR document. It is useful to provide background material that was used to develop the SMRs.

FIC Membership: Jim Swift reported that we have two people whose terms on FIC are ending, Greg Cutter and Joan Bernhard. With the SMR effort still in progress, Greg agreed to stay on through the next FIC meeting. **Annette will send out a Call for Nominations.**

Returning to the Fleet Improvement Plan

- *Joan B.*: Are there any updates on Scripps' green ship (hydrogen)? *Zoltan K.*: Scripps study indicated that it is feasible. The ship would be green and quiet. California is encouraging hydrogen energy. However, SIO doesn't want a vessel that would be too expensive to operate (which could be the case with the hydrogen-powered vessels).
- In regard to the Full Optimal Year (FOY) issue. There is too much information in Figure 8. The FOY is very difficult to understand.
- A pie chart showing what makes up the operating years was suggested.
- There could be a series of charts that show utilization. Break it down by class.

- Annette showed the FOY definition and is still not clear on how this should be included in the report.
- *Tim S.:* What can FIC do to advocate for training, outreach, event response, etc.? NOAA has requirements on how many days are needed for various types of operations - fisheries, OER, etc.
- *Jim Swift:* NSF won't fund more than 50% of their science budget on facilities. FIC should think about what should be included in the FIP – broadly thinking.
- Annette will send the FIP word document to Zoltan and Jamie.
- All FIC members were asked to provide any additional feedback to the Plan by January 5th
- A FIC web conference could be held in February if needed.

Closing Remarks – Jim Swift thanked everyone for their participation.

The meeting was adjourned at 4:30 pm.