

2014 Committee of Visitors Report for the Facilities
Programs of the Division of Ocean Sciences

RESPONSE 15 September 14, 2014

We sincerely thank the Committee of Visitors (COV) for their diligent review of the Oceanographic Centers, Facilities and Equipment programs of the Integrative Programs Section and recognizing the importance of the Ocean Sciences Division funded infrastructure in support of NSF-funded research and training of the oceanographic community. We also greatly appreciate the laudatory comments on the performance and teamwork being demonstrated by the experienced, dedicated and knowledgeable Integrative Programs Section staff in addressing the challenges of supporting the myriad of facilities as efficiently as possible. As recognized in the report, the IPS Program Directors have been proactive in reducing costs, increasing efficiency and modernizing operations and equipment, however, increasing budgetary stress over the past three years and the expected projections into the future will require continued efforts to strike the right balance within the Integrative Programs Section and as well as the science programs across the entire Ocean Sciences Division.

Recommendations

General (G)

Recommendation G(1): While we appreciate the efforts of IPS to ensure that all funded science is fielded, the program as a whole should carefully consider efficiencies in ship utilization, technical support, and instrumentation/equipment. It may be necessary to delay funded proposals to achieve maximum utilization of these assets. IPS will need to be proactive in *managing expectations* within the science user population.

Response G(1):

The Program Office concurs with managing expectations on the science side while living within the current ship funding allocations. NSF ship demands are the most significant portion of the Academic Research Fleet (ARF) usage, however, NSF is obligated to work with other agency partners to ensure efficient scheduling, which is done via UNOLS. NSF cannot manage the Fleet on its own, but does look at the mix of ships, and the possibility that under-utilized ships may need to be retired. This may require that from time to time cruises cannot be fielded within the requested year when the location requires excessive transit investment. Allowing regional demand to accumulate would result in fielding more sea-going science. OCE/IPS appreciates the COV's recognition that this philosophy can be further strengthened.

Recommendation G(2): IPS should consider combining the SSSE and OI programs and administering these together under one Program Director. In the future, this may permit combining SSSE and OI proposals to better facilitate availability of equipment needed for deployment to the academic fleet.

Response G(2):

IPS will consider combining OI and SSSE and will initiate a pilot process by allowing institutions to submit one proposal to the combined OI/SSSE panel if they so choose. IPS will evaluate whether this approach is an improvement after at least one proposal cycle. Currently, both the OI and SSSE programs are administered by the same Program Officer. As long as this organizational structure remains in place this model may work.

Recommendation G(3): Increasing efficiencies within OTS may temporarily alleviate some cost pressures, but rising personnel costs (~80% of the OTS budget) will require the management of expectations regarding the level of technical support that can be provided, given the current level of funding. This COV supports conceptual plans by the Program Director to move toward a minimization of institution-specific seagoing technicians while standing up a shared pool of same who can move amongst the academic fleet.

Response G(3):

IPS appreciates that the COV supports the creation of a marine technician pool to provide more efficient and less costly operation of technical support at sea. The issue is very complicated and occupies a large part of the Program's planning efforts. For example, a report that was just released regarding the operation of the new vessel, SIKULIAQ, strongly suggested that the vessel never sail with fewer than four technicians. The model for current operations is two technicians. Although the Program recognizes the need for greater levels of technical support given the increasingly complex systems aboard the newer vessels, budgetary constraints preclude the type of growth (100%) that is suggested. Rising personnel costs are a reality that cannot be changed, however, new approaches such as the technician pool will hopefully result in some cost savings.

Recommendation G(4): With shared pools of personnel, instrumentation and equipment, and reduction in OI and SSSE support, novel ways to handle future purchases, servicing and management of increasingly complex instruments -- such as small unmanned vehicles, both airborne and on-/sub- surface -- must be considered from a holistic view point.

Response G(4):

IPS agrees that incorporating emerging technology, particularly unmanned vehicles, will be important for a modernized and efficient Academic Research Fleet. As demand for, and availability of, survey instruments like gliders and unmanned aircraft increases, the IPS Team will involve the research community through UNOLS and other outreach to assess how to provide access to these tools. There are two existing UNOLS subcommittees, Scientific Committee for Oceanographic Aircraft Research (SCOAR) and DEep Submergence Science Committee (DESSC), which advise the UNOLS agencies on utilization and upgrades for these types of systems.

Ship Operations (SO)

Recommendation (SO1): The Program Director should continue to pay careful attention to the details of individual ship operation expenditures and use business system reviews, cooperative agreement renegotiations, annual reviews, and ship day reallocation to ensure effective management. The Program Director should continue to encourage institutional support and communicate issues associated with widely varying cooperative agreements to the larger community.

Response SO(1):

SO acknowledges and concurs that the tools within NSF to adequately control costs should continue to be used in effectively managing the ship operators and operating institutions. SO also concurs that taking every opportunity to communicate issues with the larger community is imperative to broaden the understanding of facilities challenges. This recommendation is on going and in-place as an already implemented operating model, and having the COV's recommendation will help strengthen this approach. The Program Director for SO will report on ways to reach the community to encourage institutional support.

Recommendation (SO2): While specific ship capabilities are needed for segments of the scientific community, specialized platforms need to be effectively utilized to ensure long term viability. For example, while the R/V *Atlantis* has a high utilization rate, use of the R/V *Marcus Langseth* appears low by comparison.

Response (SO2):

SO recognizes issues with the balance of specialized assets needed for the long-term, verses the lower demand for these platforms in the current budget climate. The Program Director is working to find 1) other agency demand for use of R/V MARCUS LANGSETH and R/V ATLANTIS, and: 2) to utilize when efficient, these assets to do general-purpose oceanography. This is an on-going and in place strategy. The National Academy of Sciences' Decadal Survey for Ocean Sciences will inform OCE/IPS on this issue, with a report due in the spring of 2014. Until this input is received, OCE/IPS will continue to work on diversifying the types of work that can be effectively done on R/V MARCUS LANGSETH, within the efficient operating parameters outlined in the Agencies Annual UNOLS letter, "2015 U.S. Academic Research Fleet Operations, Support, Findings and Recommendations, dated June 27, 2014.

Recommendation (SO3): Ship utilization should not fall below the current 75% of ship days available and this will require continued careful coordination with science budgets as the mix of platforms in the academic fleet evolves. While we commend the Program Director for "not leaving science at the pier", increasing ship utilization must be a factor in all future allocations even if it means that science cruise scheduling occurs on less than an ideal time frame. It is imperative that IPS as a whole, *manage expectations* of the scientific community as to what is achievable given budgetary realities.

Response (SO3):

SO concurs with managing expectations on the science side while living within the current ship funding allocations. NSF ship demands are the most significant portion of the ARF usage, however, NSF is obligated to work with other agency partners to ensure efficient scheduling, which is done via UNOLS. NSF cannot manage the Fleet on its own, but does look at the mix of ships, and the possibility that under-utilized ships may need to be retired. As mentioned above, the Annual Letter on Findings and Recommendations for the Fleet gives an outlook to the community that potentially prepares the operators for the possibility of lay-up or retirement of vessels, and any policy that may need to mitigate under-utilization. IPS will continue to use this tool as a way to communicate and manage expectations.

Ship Acquisition and Upgrade (SAU)

Recommendation (SAU1): The SAU Program should remind reviewers of the rarity of ship acquisition projects and that reviews should reflect the extensiveness of the proposals submitted. The Program Director may need to consider new models to ensure that reviews are of high quality considering the rarity, importance, and size of the program.

Response (SAU1):

The SAU Program will emphasize to all participants in the merit review and planning process for vessel construction how important rigorous evaluation of every aspect of ship construction is, given the opportunities are few and the consequences endure for decades.

Recommendation (SAU2): Given IPS goals of modernizing the Academic Fleet, the SAU Program should make every effort to improve this process by *managing expectations* within our science user population. While the time-honored tradition of seeking broad community input through the definition of science mission requirements (SMRs) should not be abandoned, there needs to be recognition that new ship designs must meet the broadest science needs possible. Finding a way through this maze and shortening timelines for replacement vessel definition and design/build would be a worthy topic for a dedicated workshop tasked with this endeavor. Effort to ensure that the Academic Research Fleet size genuinely reflects realistic needs for supporting future levels of seagoing research demand and utilization is needed. The forthcoming NAS Decadal Survey should provide useful input in this determination as well as for the likely SMRs of future ship builds.

Response (SAU2):

The SAU Program agrees with the need to define ship construction specifications appropriate for their missions. For this reason, the current Regional Class Research Vessel Project incorporates input from its Science Oversight Committee (SOC), as well as the UNOLS Fleet Improvement Committee (FIC) and anticipates useful feedback from the NAS Decadal Survey to insure these designs retain their scope as regional

vessels, and not become Ocean Class. This approach has worked well in the recent past for the R/V SIKULIAQ construction, and should help constrain mission creep for RCRV.

Submersible Support (SS)

Recommendation (SS1): The Program should continue to use cooperative agreements and play an active role in monitoring expenses and use.

Response (SS1):

The SS Program agrees Cooperative Agreements are the appropriate management mechanism for the National Deep Submergence Facility (NDSF). This allows for significant involvement by the Program in the operations and maintenance of the Facility, and provides tools, such as a Major Overhaul Stabilization Account (MOSA), that support more efficient management of long-term objectives.

Recommendation (SS2): The SS Program should conduct an operational assessment of personnel efficiencies.

Response (SS2):

As part of the upcoming review in 2015 of NDSF, which recurs on a five-year cycle, the SS Program will utilize expertise from the NSF Division of Acquisition and Cooperative Support (DACCS) to scrutinize the efficient use of operational personnel. This will be in addition to the rigorous review of the operational proposal as a whole by an external Panel of diverse experts from the community.

Recommendation (SS3): The SS Program should expand the diversity of expertise of NDSF proposal reviewers to include university and industry marine submersible operators.

Response (SS3):

The SS Program agrees the expertise and perspective of all deep submergence stakeholders, including academia, industry, U.S. Government, and international operators is critical to the robust evaluation of NDSF operations. The upcoming review in 2015 of NDSF operations will include as broad and deep a diversity pool as possible in the Panel membership, accounting for all areas of experience within the deep submergence community.

Recommendation (SS4): The SS Program should examine the need for metrics from a managerial and programmatic standpoint; engage appropriate level expertise to

define simple metrics and goals that can be used to communicate the value of NDSF activities to funding agents (see next).

Response (SS4):

The SS Program agrees meaningful metrics for success are critical when planning and executing deep submergence facility support. The SS Program will benefit greatly in this endeavor from the ongoing interagency effort to define and standardize the metrics for Academic Research Fleet utilization, which is part of the National Ocean Policy Implementation Plan.

Recommendation (SS5): The COV suggest that a community workshop be supported that focuses specifically on deep submergence science in order to discuss current and future needs.

Response (SS5):

The SS Program agrees that a broad community assessment of the needs of deep submergence science is timely. The SS Program will task DESSC with recommending a strategy to gather input from the broad community.

Recommendation (SS6): Add specific guidance with respect to the use of non-NDSF submersibles, ROVs and (large) AUVs to the NSF directive(s).

Response (SS6):

IPS published "Clarifications on National Science Foundation Division of Ocean Sciences (OCE) Facilities Costs and Coordination" available at: http://www.nsf.gov/geo/oce/pubs/oce_facility-use-clarification-may12-rev6.pdf primarily to clarify the use of non-UNOLS vessels from a safety standpoint. However, the policy also applies to other facilities, such as those like NDSF. NSF does not have a solicitation specifically for the use of ships, submersibles or ROVs. However, the SS Program will continue to reach out to the deep submergence user community and explain that non-UNOLS deep submergence assets are perfectly allowable for inclusion in science proposals. One frequent venue for this outreach is the Early Career (now New User) symposium held concurrently with the Fall DESSC meeting. The SS Program will also task DESSC with including this topic in any strategic planning for a workshop, as described previously.

Recommendation (SS7): The SS Program should coordinate with Oceanographic Instrumentation to proactively investigate feasibility of a pool for gliders and/or small AUVs.

Response (SS7):

The feasibility of establishing a glider pool will be investigated between the OI, SS, and the OCE science programs, as well as included in any strategic planning for a workshop, as described previously.

Oceanographic Technical Services (OTS)

Recommendation (OTS1): The OTS Program should strive to have balanced review panels consisting of individuals from single ship and multi-ship operator institutions, and individuals representing a variety of research vessel classes.

Response (OTS1):

The OTS Program accepts the recommendation of the COV and will endeavor to form future panels with individuals from single ship and multi-ship operator institutions, and individuals representing a variety of research vessel classes. Although the pool of qualified panelists is small, the OTS Program will make every effort to implement the COV's recommendation.

Recommendation (OTS2): While shore-side maintenance and pre-cruise planning are important duties of marine technician groups, better balance needs to be attained between shore and seagoing activities. The Program Director, in part using the annual reviews, should monitor the budgetary seagoing technician expenditures relative to shore support. Initial investments in establishing a technician pool is viewed as a move in the right direction and the program is encouraged to move forward with their plans to develop a pool of technicians that will support the academic fleet. The OTS Program should also consider moving from five-year awards to cooperative agreements like the SO Program in order to achieve greater flexibility in funding marine technician groups. Efficiencies and savings from economies of scale should continue to be explored.

Response (OTS2):

The OTS Program Director monitors the sea-going expenditures vs. shore-side support as outlined in the annual reports. Budget data and spending trends are reported, and are an integral part of the yearly budget negotiations. The "tech-pool" effort is continuing and it is expected that the solicitation to host such a Pool will be released by mid-2015. The OTS Program agrees that this is an important step forward and appreciates the concurrence of the COV. The Program will consider changing the Tech Services Grants to Cooperative Agreements. This has been explored previously, and no clear determination of the preferable management tool was identified. Nevertheless, the Program will award some of the larger, more difficult grants using Cooperative Agreements as a pilot.

Recommendation (OTS3): Internet communications are an essential service provided on research vessels, allowing for the efficient trouble-shooting of problems, communications with shore support personnel and for morale. The OTS Program is currently undertaking a study of how bandwidth is being used. Plans by the OTS

Program to shift the costs of this service to the SO Program budget are appropriate. The OTS Program should use the findings of the bandwidth study to establish a base line capability, above which, individual users pay for the costs.

Response (OTS3):

The OTS Program agrees and plans to proceed as recommended.

Recommendation (OTS4): Approximately \$50M has been invested in Multibeam systems across the academic fleet. The establishment of an advisory committee to optimize the collection of Multibeam beam data, operations and quality is considered a good investment of funds and should be continued. Similarly, expansion of the R2R Program to work with international collaborators is also a move in a positive direction and is encouraged to maximize access to the data being collected.

Response (OTS4):

The Program appreciates that the COV concurs with the current operating model for optimizing and administering valuable oceanographic data.

Recommendation (OTS5): Investments in education and training are critical to maintain a pool of qualified marine technicians that can operate, maintain and troubleshoot increasingly complex instrumentation and equipment. This is viewed by the COV as a very good use of funds and the program is encouraged to promote these activities and identify future opportunities in these areas.

Response (OTS5):

The OTS Program continually encourages the Institutions to invest in training. Unfortunately, when asked to cut their budgets, this is an area that is often reduced. That trend has reversed in recent years with the programmatic funding of fleet-wide training initiatives co-hosted with NOAA. Furthermore, the OTS Program Director is including the requirement for continual training into the Tech Pool solicitation. Part of the evaluation criteria will be the thoughtfulness of the proposed training program.

Shipboard Scientific Support Equipment (SSSE)

Recommendation (SSSE1): A more stable budget will enable better large scale planning for out years and more evenly paced revitalization of SSSE Program needs.

Response (SSSE1):

The SSSE Program Director agrees with the COV recommendation. A more stable budget would enable better planning, however, the Program has limited influence over budget allocation. Program funding decisions will continue to be made by weighing the availability of funds against the urgency and priority of the needs expressed by the

operators. The External Review Panels will continue to play a critical role in vetting the priorities. Managing the SSSI and OI Programs jointly may provide slightly more flexibility in the process.

Recommendation (SSSE2): The SSSE Program should continue to promote utilization of shared used equipment (and instrumentation) pools.

Response (SSSE2):

The SSSE Program will continue to promote utilization of shared use equipment (and instrumentation) pools. Any request in both SSSE and in OI that is duplicated by another institution is considered for a group purchase. In addition, all requests are evaluated based on existing inventories and if that equipment exists, the shared use is a first option.

Recommendation (SSSE3): The COV proposes NSF institute a “Special SSSE” proposal that could be submitted anytime to NSF to fund and correct noted critical deficiencies from the NSF Ship Inspection Program. A dollar amount of this “Special SSSE” proposal could be established (i.e., deficiency must cost over \$10K).

Response (SSSE3):

IPS appreciates the COV recommendation, however, does not agree on there being a need for a new proposal solicitation. Both the SSSE and OI Programs accept proposals at any time throughout the year. Generally, the institution contacts the Program Director and explains the situation. Funds can be allocated either through a new proposal or supplemental funding depending upon the circumstances. Both the SSSE and the OI Programs retain some funds, if possible, to support requests throughout the year. This Recommendation is considered Closed.

Recommendation (SSSE4): The SSSE Program should continue use of these inventories, with incremental increases in funding in order to obtain a more encompassing pool.

Response (SSSE4):

Continuing awards generally come with incremental increases. The Program will support these to the degree possible within the budgets provided. This Recommendation is considered Closed.

Recommendation (SSSE5): The SSSE Program should continue to solicit and incorporate reviewer, panel, operator and technician recommendations for funding group purchases. The group purchase of equipment benefit the academic fleet; and is

of particular benefit to single ship operator institutions that do not have the “buying power” of a large fleet.

Response (SSSE5):

Group purchases have and will continue to provide value for the government and will be continued whenever possible. This Recommendation is considered Closed.

Recommendation (SSSE6): The COV recommends a percentage of total SSSE budget (suggest 10%) be held for unanticipated equipment issues. If these funds are not expended after ~ 80% of the year has transpired, for example, then the Program Director may award these funds to meritorious proposal(s) that did not receive funding during the normal panel review process.

Response (SSSE6):

The SSSE Program Director will continue to maintain a reserve to fund unexpected issues, within the constraints of existing program obligations and unknown budget allocations. It is in the best interest of the facilities to do so, and most programs do it whenever possible.

Oceanographic Instrumentation (OI)

Recommendation (OI1): The COV suggests that grouping the OI and SSSE Programs together makes programmatic sense, as it would allow the institutions that operate the vessels in the Academic Fleet to assess the overall capabilities of their platforms and make a more holistic request to IPS for both scientific instrumentation as well as support equipment in a single proposal submission.

Response (OI1):

While the OI Program Director appreciates the COV recommendation, there does not appear to be a real advantage to using this approach. Nevertheless, Program will advise the Institutions that if they find it much easier, they can submit one proposal rather than two. Over the next year the Program will evaluate the idea of consolidating the OI and SSSE programs and determine if there is any advantage to doing so.

Recommendation (OI2): The OI Program should encourage the use of the OI database for management decisions, which would also help to enable the use of instrument pools in the future, should that be determined to be a useful construct for reducing costs.

Response (OI2):

All requests to the OI Program are evaluated based on existing inventories (held in an OI database) and if that equipment exists, then shared use is a first option. Pools are funded separately and no funds for pooled equipment are given to the institutions unless they manage the pool. The idea is to lower costs and provide a better service.

Recommendation (OI3): IPS should engage the community in a discussion of future instrumentation needs, and use the results of the discussion and the database of existing instrumentation to create a vision that includes a notional schedule for future instrumentation acquisition for the academic fleet.

Response (OI3):

The OI Program Director agrees this is an excellent recommendation. IPS is criticized for being short sighted at times and then being surprised with new demands of the industry. The Program will focus on future directions for instrumentation during this year's INMARTECH and RVTEC conferences. Maintenance of the instrumentation database is a requisite for funding so it will be kept current by the Institutions involved.