

2022 Committee of Visitor's Report on the Integrative Programs Section of the Ocean Sciences
Division of the Geoscience Directorate
RESPONSE 30 October 2022

We sincerely thank the Committee of Visitors (COV) for their diligent review of the Ship Operations (SO), Submersible Support (SS), Oceanographic Instrumentation (OI), Oceanographic Technical Services (OTS), Shipboard Scientific Support Equipment (SSSE), Ship Acquisition and Upgrade (SAU), Ocean Technology and Interdisciplinary Coordination (OTIC), International Ocean Discovery Program (IODP), Ocean Drilling Program (ODP), Ocean Observatories Initiative (OOI), and Education/Human Resources (EHR) 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 positive comments on the management, 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 community engagement, managing budgetary challenges, increasing efficiency, and modernizing operations and equipment. Of note from the report was the COV's mention of the IPS's response to the COVID pandemic, highlighting the "efficacy of the program officers". Increasing budgetary stresses and continued recruitment of a seagoing workforce to support ship operations are noted as continued challenges looking forward. These challenges 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

COV Recommendation 1: IPS should be more specific about what is expected for Broader Impacts, especially with regards to Facilities and Ocean Instrumentation proposals. These expectations should be communicated to both the proponents and reviewers. This should yield more consistent reviews for these particular programs.

Response Recommendation 1: *IPS agrees that broader impacts are not as thoroughly discussed in instrumentation and Shipboard Scientific Support Equipment (SSSE) panels as compared to the science panels, and this difference will be a focus area for improvement in the future. The COV did comment, however, that "Our assessment finds that the overwhelming majority of OI/SSSE proposals meet criterion 2 (Broader Impacts) by default as they are requesting support for vessel infrastructure that supports NSF-funded projects". This support has the inherent broader impact of supporting the larger field-based scientific enterprise. Furthermore, NSF is currently reviewing Broader Impacts guidance. OCE/IPS is involved in that effort and will review and update the guidance, as appropriate, for addressing Broader Impacts in proposals submitted to IPS Programs.*

COV Recommendation 2: IPS should reach out to other Facilities-based Directorates, Sections, and/or Programs to see how they handle the Broader Impacts requirement.

Response Recommendation 2: *IPS will indeed reach out to other programs to understand how they handle the Broader Impacts requirement. In the event that, through these conversations, new specific opportunities for addressing Broader Impacts arise, IPS will endeavor to implement these suggestions as appropriate.*

COV Recommendation 3: We recommend that the NSF add to its risk register the reputational damage that might result from a failure of an NSF-supported facility due to mismanagement of internal requirements.

Response Recommendation 3: *IPS will work with OCE and GEO Directorate Leadership to ensure future NSF risk assessments include the risk of institutions unable to meet the compliance requirements that arise over time.*

COV Recommendation 4: Now that the IPS Self-Study exists, we recommend that IPS provide an updated version as the first step in the COV review process, followed by previous COV reviews and responses. This gives the next COV an idea of what to be looking for when the e-jackets are assigned. Focusing on the e-jackets first is very confusing because the committee does not understand what they should be assessing in those jackets. Further, even though IPS allowed more time for the COV to do their review, much of that time was wasted reading detail in the e-jackets that was not needed for the overall review. The orientation could provide an overview of what is available in the e-jackets and what can be learned from each. Editing the Orientation documents to reflect the priorities of the COV would make the process more efficient and of greater value to NSF.

For the EDU program, we noted that some recommendations were followed (like including data on minority participation, gender balance) but the data are sparse, and it is not clear what is being done to improve data collection efforts.

For the OI/SSSE programs, the previous COV recommended that OI/SSSE should review and rate proposals with respect to sound scientific justification. The Programs responded (in general) by noting that both SSSE and OI proposals are based on funded science and are requests to acquire gear to carry out the funded work. Our assessment of OI/SSSE is consistent with the Program's perspective: We noted that the proposals are for equipment and instruments that enable funded science. We also noted that, when proposals are rejected, the POs provided a sound rationale as to why (e.g., the instrument already exists on another vessel, and its infrequent use means it can be borrowed with ease). The COV also suggested that OI/SSSE provide feedback on both evaluation criteria. Our assessment finds that the overwhelming majority of OI/SSSE proposals meet criterion 2 (Broader Impacts) by default as they are requesting support for vessel infrastructure that supports NSF-funded projects. The COV also recommended that the PO continue to work with the marine technicians to improve the quality of their proposals. We discussed this at length

among ourselves and with IPS POs who made the case that the proposals -though less polished than others in OCE- are technically accurate. They also noted that the many proponents have an excellent track record in marine operations, which is of far greater value to the community than is the quality of their proposals. We, the current COV, broadly agree with the IPS's response to the recommendations above. However, we encourage IPS to continue working with ship operators to improve proposal submissions by providing specific guidance (e.g., a template).

Response Recommendation 4: [1] *We are glad that the COV found the self-study valuable, and we plan to continue to this practice along with providing information from prior COV visits. Further we will attempt to provide information that would assist the COV in streamlining its synthesis.* [2] *In terms of addressing the point that minority and gender participation data are sparse for the EDU program, the program notes that it is not possible to require optional data.* [3] *The technical proposals, although perhaps not always as well written as the science proposals within OCE, have shown improvement over the past several years. This difference in perceived quality is largely the result of providing specific templates to the Principal Investigators and minimizing the amount of narrative that is required. This approach is difficult to do with regards to Broader Impacts as these are often less formulaic, but the templates have made the proposals easier to read and understand.*

COV Recommendation 5: We recommend that NSF empower IPS with additional financial and managerial resources to improve DEI in ocean sciences and support their efforts to develop programs that recruit and maintain a diverse community of scientists in our discipline.

Response Recommendation 5: *DEI is an important consideration for actions and resources across NSF, GEO and in OCE. New initiatives and other strategies may emerge that have DEI improvement as a targeted outcome. IPS will participate in opportunities to improve DEI as they emerge.*

COV Recommendation 6: We further recommend that IPS attempt to better track the efficacy of their DEI efforts. We recognize that many of these outcomes are more qualitative in nature (e.g., the success of each individual is hard to quantify), but we feel that even qualitative representations of how their programs have improved DEI is a worthy contribution.

- The self-study was a very useful document, but it is missing policy explanations that underpin the actions of Section personnel as they carry out their duties and experience external forces that affect the section and its actions.

Response Recommendation 6: *IPS will continue to query demographic information from NSF databases, establishing a baseline of current involvement of underrepresented groups and groups involved in broad DEI efforts. This baseline will then be used to track the impacts of targeted opportunities for DEI improvement.*

COV Recommendation 7: We recommend that the self-study be expanded to include more information on how managerial actions have been altered (if the case) to deal with disruptive forces like Covid, project cost increases, and inflation of facilities' operating costs.

-NSF is growing programs which are characterized by increased systems engineering designed to operate in demanding environments. IPS is well prepared to contribute to this additional technology emphasis since ocean engineering is a core competency of ocean science.

Response Recommendation 7: *External factors such as COVID-19, supply chain disruptions, and disproportionate inflation of costs that affect IPS programs and projects may continue for the foreseeable future. IPS will document community planning and mitigation activities for these externalities in future self-studies.*

COV Recommendation 8: We recommend that NSF provide training for IPS POs in risk analysis, large effort project management, and systems engineering trade space analysis offer Section engineering expertise to other NSF divisions and institute a seminar program across NSF to exchange ideas about these issues from colleagues from NASA, ONR, DoD, and NIH.

-Long serving crew have been a hallmark of the academic fleet, but COVID, supply chain disruptions, and workplace changes have put this benefit to science at risk. While providing people is a fundamental role for the IPS, the health of the community requires the Section to anticipate the trajectory of such disruptive trends and take community action with partners such as ONR and NOAA to mitigate effects.

Response Recommendation 8: *NSF major facilities programs and projects are supported by an Integrated Project Team (IPT), which is comprised of subject matter experts with "core competencies" across all relevant areas needed for proper management, including project management, legal, financial, scientific, as well as other areas. IPS program managers are encouraged to participate in training, including project management and risk assessment, which is provided by the NSF Academy and external training providers.*

IPS has been working with ONR and NOAA and the University-National Oceanographic Laboratory System (UNOLS) to help the community cope with the disruptions in the workplace. Through the UNOLS Crew Tiger Team, several recommendations have been put into place, such as providing support for a new Crewing Coordinator position in the UNOLS Office with the responsibility to conduct outreach for crew recruitment, to analyze crew retention, and to support a crewing pool within the Academic Research Fleet (ARF).

COV Recommendation 9: We recommend that the NSF enlist other ocean science agencies (ONR, NOAA) and institutions (UNOLS, COL) to assist with a method for ensuring appropriately well-trained ship operators, engineers, and other seagoing technicians.

Response Recommendation 9: *NSF routinely funds training cruises (and shore-side training), focused on a particular oceanographic discipline to assure that scientists, crew, and technicians*

are exposed to the demands of various cruises. Funding for these efforts has been primarily through NSF but has included contributions from ONR and NOAA. Participants have included scientists funded by NSF, ONR, and USGS as well as technicians from the ARF and NOAA.

COV Recommendation 10: We recommend to the NSF senior leadership that filling vacancies should be elevated to high priority.

Response Recommendation 10: *IPS will continue to work with the OCE and GEO Directorate Leadership on staffing levels.*

COV Recommendation 11: We encourage IPS to continue ensuring that activities using federal funds follow appropriate laws. This is especially relevant to cooperative agreements, where NSF has more jurisdiction over the activities. We are especially concerned about misconduct at sea, as many open positions are being filled by mariners with limited or no experience on board research vessels, working with scientists, etc.

Response Recommendation 11: *NSF is contemplating action that will require certification or planning for a Safe and Inclusive Field/Vessel/Aircraft Research for NSF projects that include fieldwork. IPS has been a standing member of the internal NSF working group on this initiative. OCE/IPS has also supported the interagency project that produced the safe and inclusive workplace videos and has been an ad hoc member of the UNOLS Maintaining an Environment of Respect Aboard Ships (MRAS) committee.*

OCE/IPS will continue to help provide operators the tools they need to ensure that mariners understand the environment that is expected on aboard vessels.

COV Recommendation 12: NSF should provide to IPS the clearest possible guidance on how Title IX issues should be dealt with respect to cooperative agreements.

Response Recommendation 12: *IPS is engaged with the NSF Policy Office on Title IX, and following the Foundation's guidance, has provided the allowable information to the awardees.*

COV Recommendation 13: We suggest that IPS include at least one person from previous year's COV to serve in the current year. Having this historical knowledge about procedures and other nuances of the COV process should save time for the new committee.

Response Recommendation 13: *IPS attempts to include participants who have previously served on a COV, if not specifically on the IPS COV, since it is held only once in four years. This COV included one participant who was also a member of the 2019 Ocean Section COV.*