

2005 Committee of Visitors Report for the Facilities Programs of the Division of Ocean Sciences

RESPONSE

The Committee of Visitors (COV) is to be congratulated, not only in utilizing the new electronic COV module in eJacket, but also in being the first COV to access jackets remotely in the two-week period prior to their meeting at NSF.

We are gratified the COV found that the Facilities programs in the Integrative Programs Section (IPS) are well managed and efficiently run by dedicated program directors. Specifically, we take heart in the findings that the Section provides leadership and vision, that planning and prioritization for renewal has been excellent, and that the programs have done an excellent job in terms of providing platforms and shipboard facilities. We are pleased that our business practices (e.g. bulk purchases across the fleet) are applauded by the COV, and that the importance we place upon involvement of the user community is recognized.

Findings

Maintaining and renewing the existing facilities. The COV expressed its agreement with a guiding principle of the Geosciences Directorate that even in times of fiscal uncertainty it is important to focus on the future needs of the ocean going community through upgrades and acquisitions and provision of major equipment.

Quality and Vision of the Staff. The Committee reviewed the four major planning and acquisition efforts ongoing during the reporting period and found them to exemplify the skill and creativity of operations within IPS. These were the acquisition of the highly capable seismic research ship R/V Langseth, planning for a series of three Regional Research Vessels, design and construction of the deeper diving replacement submersible for DSV Alvin, and completion of the design for the Alaska Region Research Vessel. The Committee indicated that in each case, our handling was customized for the particular situation, and showed great flexibility and responsiveness to effectively deal with community concerns.

Funding balance between facilities and research The COV noted the recent strains imposed by the joint effects of stagnant or reducing budgets in the recent past and likely the near-term future, and escalating costs associated with fuel, personnel, security, training, environmental permitting etc. They recognized that directing more resources into facilities required withdrawing resources from research programs. “These constraints are the basis for many of the questions and concerns raised by this COV” (COV Report, 2005) and recommendations noted below.

Considering Facilities Costs as Part of the Scientific Review process. The COV recommended that the overall costs of the proposal should be available in a merit review, so that the reviewer understands the real costs of a proposal. For at least three decades we have provided the panelists with information on the daily rate costs of all the ships. We have also asked them to consider these costs relative to the merit of the proposed research, and the number of days and size of the ship requested relative to the job at hand. We have not provided routinely such cost information to mail reviewers on a proposal-by-proposal basis, but have pointed it out in general terms over the years in newsletters, site visit presentations, posters at national meetings etc., and it is readily available. Mail reviewers do provide input on the appropriateness of ship days when they desire. The Division has never required P.I.s to add in the ship day, marine technician and other facilities costs to the bottom line of the proposal budget. We believe that the community has always been aware that some kinds of research inherently cost more than others, and there is a limit to the degree to which one can take the overall costs into consideration. Should deep ocean research be subject to a more stringent review process based on its much greater costs compared with coastal or estuarine research? Should research involving no ship time be

avored by virtue of its lower costs? These are not questions for IPS alone to wrestle with, but for the whole community to debate once again.

Dealing With New Types of Facilities Required by the Community. The COV is worried that the full weight of planning in the community for a range of new platforms (e.g. gliders buoys, AUVs and other major facilities) does not appear to be taken as seriously as needed for the health of the ocean sciences community when compared to the research vessel fleet. The role of the Facilities group of programs from their inception has been to support the UNOLS fleet and the submergence assets based on two memoranda of understanding signed by Navy, NOAA and NSF. The role of planning for the full range of facilities is spread broadly throughout the Division. The range of equipment and platforms utilized in the ocean sciences is spread along a continuum from the very smallest to the very largest. Much of this is supported directly by the science programs (small boats, buoys, drifters, gliders etc.). Sensors, sensor systems, and underwater communications development is also supported by the OTIC program in preparation for OOI, and historically that program has cooperated with science programs in supporting instrumentation and platform development. The new IODP includes science and facilities planning as did the former program.

Nevertheless, the Facilities programs have made significant efforts to plan and jointly fund projects with other programs within NSF and beyond, and to seek planning advice from the community. We have helped to fund a new deep coring capability jointly with the Marine Geology and Geophysics program to be installed on the R/V Knorr. We are also funding the development of a hybrid AUV jointly with the NSF Office of Polar Programs and the Navy, which will be capable of full ocean depth and under ice operations. The UNOLS Deep Submergence Science Committee (DESSC) recently undertook, at our request, to examine the management, safety requirements and funding of potential submergence assets currently outside the National Deep Submergence Facility either at other institutions or in commercial hands.

In the early 1990s, the Advisory Committee for Ocean Sciences studied the issue of facilities management in its broadest sense, but was unable to suggest a unified approach. Now may be the time for the AC/GEO Ocean Sciences subcommittee to take a fresh look at planning for emerging facilities, and their management and implementation within the Division, and make recommendations for the way forward.

Corporate Knowledge of IPS Facilities Staff We appreciate the kind words on our skills and corporate knowledge, and the recognition of increased workload over the past three years. The Division and Directorate will not doubt consider the need for a mechanism to preserve these attributes through inevitable personnel changes/retirements. It should be noted that the Division is about to hire a program officer for environmental matters, which should help to alleviate the burgeoning workload for several of us over the past three years.

Recommendations

OTIC should be reviewed along with other IPS facilities. The COV did review all the facilities presently within IPS. Prior to 2000, Ocean Technology and Interdisciplinary Coordination (OTIC) was part of the old Ocean Sciences Research Section, however, after a reorganization in 2001 it fell under the purview of IPS. It primarily funds coastal and technology development research, and has continued to be reviewed by the OCE research program COV (due in 2006). More recently, the program has undertaken planning activities for the Ocean Observatory Initiative (OOI). Although still in its planning phase, this initiative is an NSF Major Research Equipment Facilities Construction (MREFC) project. Funds to begin construction will not be requested from Congress before FY 2007. The extent of the project and the nature of the installed infrastructure is still only generally outlined. For this reason, the nature and extent of ships and submersible vehicles that may be required to install the infrastructure and maintain and operate it is presently equally uncertain. It may be that OOI will evolve into a separate self-contained entity, similar to the IODP, which combines facility and research components.

This month (October, 2005) proposals resulting from a call to the community to identify OOI research projects and the infrastructure required for them are being reviewed. In the following months the best of the highly reviewed proposals will be integrated into a coherent vision for the definition of OOI, using extensive community involvement. Out of this process will evolve a much clearer picture of the extent and nature of infrastructure required and the likely facilities and ongoing maintenance/operations activities also needed. This will provide a clearer picture of the most appropriate management structure for the Division to adopt. If the UNOLS fleet becomes heavily involved in servicing the ongoing operations of OOI, integration into fleet planning, acquisition and operations will be required, and these activities will certainly be within the purview of the Facilities COV. **Action:** As the planning process moves forward the Directorate, in consultation with the Division, will determine the appropriate mechanism for COV review for OOI infrastructure and operations.

Maintaining an Open Process for Future Upgrades and Acquisitions. While the Committee indicated that the approaches used to manage the upgrade and acquisition of research vessels have been very effective, tailored to the situation, and very creative, they worried that we must remain vigilant to insure that the processes are open to community input and perceived as being fair. They noted that the proposals for the design and construction of the Alvin replacement and acquisition/conversion of the R/V Langseth were unsolicited, and not received through open competitions. Both of these projects began as efforts to upgrade the existing facilities. We agree that where appropriate solicitations should be announced for open competitions for major facilities. In these cases, however, we believe there were special considerations. The R/V Ewing was overdue for a customary midlife refit and discussions continued over several years between NSF and Lamont Doherty Earth Observatory (LDEO) regarding options. NSF funded a community workshop to examine various options for renewal. A strong recommendation from the workshop reflected the need to pursue the possibility of acquiring a commercial survey vessel with state-of-the-art three dimensional (3-D) seismics. The oil exploration industry was depressed at the time and 3-D seismic ships had come onto the market at a fraction of their construction cost. LDEO identified such a vessel, proposed to NSF to acquire it, and a stringent review process was undertaken as noted by the COV.

Similarly, the Alvin replacement started out as a major upgrade effort for the aging vehicle. There were many design and mission requirement discussions within the UNOLS Deep Submergence Science Committee over several years. Also a major community workshop was held at NSF, and a study and report was by the Ocean Studies Board of the National Research Council. Woods Hole Oceanographic Institution proposed a solution based on the outcomes of these community efforts that, following extensive review in which the institution was found to have the world class resources essential for this high-risk undertaking, was funded.

In both cases, the Directorate presented the mechanism for acquisition to the National Science Board. We also insisted that both facilities would be operated as National Facilities (as is the Alvin currently), with independent oversight committees of UNOLS advising NSF. **Action:** As noted above, we agree that where possible there should be open competitions for operation of new facilities. We have publicly declared that the ARRV and Regional Class ships will be openly competed.

Streamlining the Tracking of maintenance and upgrades of research vessels. The recommendation is for a more formal or rigorous procedure to insure that deficiencies or problems noted in the assessments are tracked until remedied. We agree that this is necessary. For the past several years we have funded the UNOLS Office to work with a software developer at the University of Delaware to work on web based tracking software. This group has long been funded to maintain the "Oceanic" world wide research ship schedule data base, and thus understands the highly specialized environment of research vessels. Progress has been slow because new functionalities have been suggested, which added to the complexity of the task.

The current system of tracking works effectively, but it depends on the knowledge and history of the current staff, which will inevitably change as noted in the section above. Currently, ship operators must respond within ninety days of receiving the NSF inspection report to the recommendations identified. Additionally, each

annual ship operations proposal must further update progress made on initiating the inspection team recommendations and a copy is provided to the NSF Ship Inspection Program Manager. The panel that reviews the annual Scientific Shipboard Support Equipment proposals refers to the inspections in making their decisions on needed equipment. The inspectors refer to all this information, as well as post cruise assessments, during subsequent inspections and report on discrepancies. **Action:** The development of the new web-based electronic tracking system development will be completed as soon as possible.

Automating the Ship Scheduling Process. Over the years, software to automate scheduling has been investigated, although not in the past five years of the current Section Head's tenure. Previous attempts have fallen far short because of the complexity of factors involved. We try to have the major scheduling meeting six months prior to the beginning of the scheduled year (i.e. midsummer for the following January). Agency budgets at the summer scheduling meetings however are frequently uncertain, and adjustments have to be made on an almost continuous basis well into the operating year. Such adjustments often involve protracted negotiations with the PI (who may have teaching or other conflicts), ship operator, agency potentially funding the cruise. Other consideration in the re-scheduling process include meeting event and weather windows and the desire to minimize expensive transits. UNOLS was originally formed in 1972 at the request of NSF to coordinate the scheduling process. **Action:** We will request UNOLS to evaluate current state-of-the art scheduling software.

Increasing Cost Effectiveness. The 2002 COV recognized the cost effectiveness of bulk purchases we had initiated across the fleet (science vans, radar, safety gear etc.) and the current COV applauds the practice that has continued and expanded, recommending its continuation. **Action:** We will continue to look for every opportunity for cost savings through bulk purchases.