

2005 COMMITTEE OF VISITORS REPORT FOR THE NSF OCEAN SCIENCES DIVISION

Date of COV: September 14-16, 2005
Programs: Integrative Programs Section, Facilities
Division: Ocean Sciences
Directorate: Geosciences

Committee Membership:

Mary Silver (Chair) University of California, Santa Cruz
Francisco Chavez (Co-Chair), Monterey Bay Aquarium Research Institute
Anna-Louise Reysenbach, Portland State University
Bauke Houtman – Captain, USN ret., Ocean.US
Barbara Moore, Director, National Undersea Research Program

2005 COMMITTEE OF VISITORS REPORT FOR THE NSF OCEAN SCIENCES DIVISION

COV Review Process

A Committee of Visitors (COV) met from September 14 to 16, 2005 at the National Science Foundation to review the Ocean Science Facilities programs within the Integrative Programs Section of the Division of Ocean Sciences (OCE). The review presented here includes the programs that support Ship Operations, Oceanographic Technical Services, Oceanographic Instrumentation, Shipboard Scientific Support Equipment, Ship Acquisition and Upgrade, and several related activities. The charge to the Committee of Visitors was to provide NSF with external expert judgments in two areas: (1) assessments of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions; and (2) the degree to which the outputs and outcomes have contributed to the attainment of the NSF's mission, strategic goals, and annual performance goals.

The COV was provided with documents and figures related to program activities. For the first time proposals and documents were available via the web through an electronic jacket. Some of these were provided prior to the meeting and the site was continually updated during the meeting. Section Head (Mike Reeve) and Program officers (Linda Goad, Dolly Dieter, Sandy Shor and Holly Smith) presented summaries of program activities to the COV on September 14. The COV then examined the FY2004 proposal files for each of the Facilities programs and prepared the report.

This COV report follows NSF's recommended format for 2005, including Core Questions for Parts A, B and C of the Review Template. These questions address the efficiency and integrity of the program's proposal processing and management, and the outcome of these investments in terms of NSF's goals in People, Ideas and Tools. We note that IPS does not fit into the typical NSF research program management and aspects of the template are not applicable to IPS. This report also includes a summary of the Division's response to the last COV (in 2002), and a summary of the COV's findings and recommendations.

The COV wishes to thank the program management and staff for their assistance in assembling the budget information necessary for the committee to do its work.

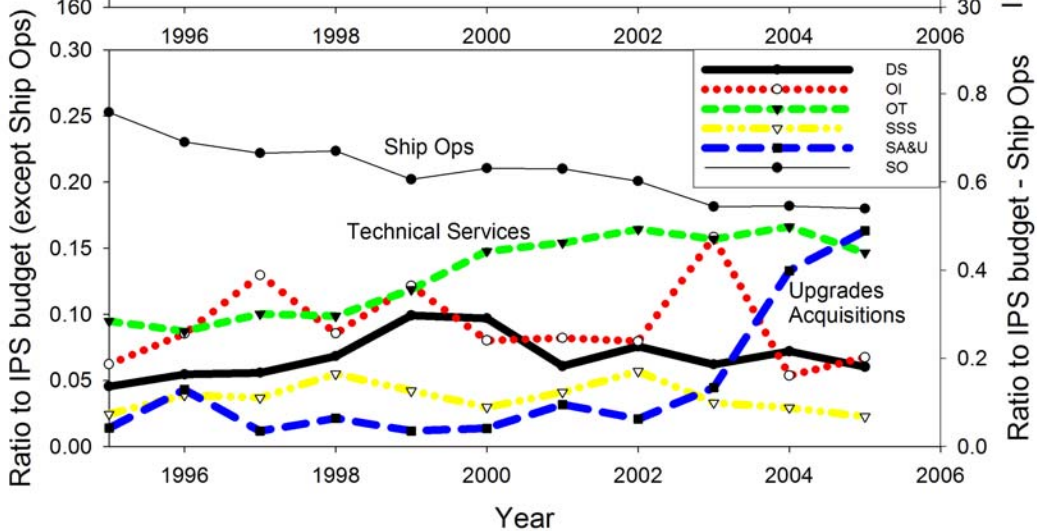
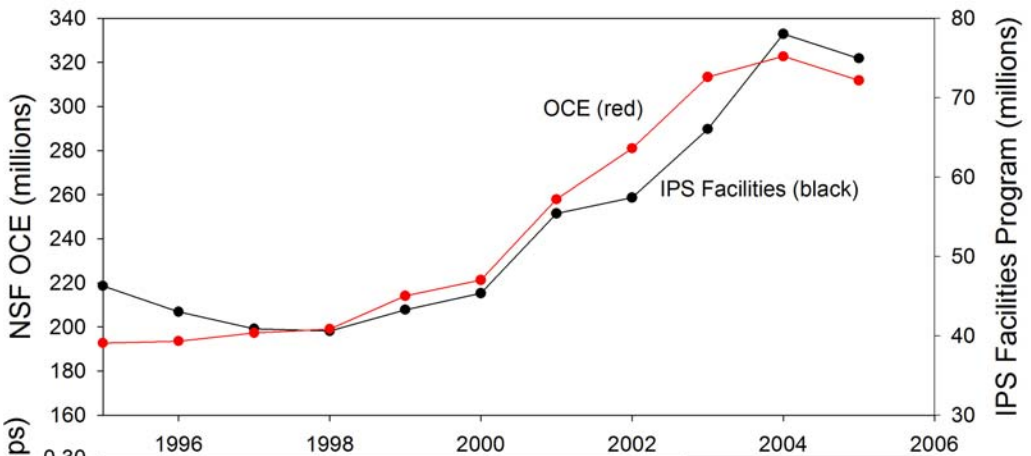
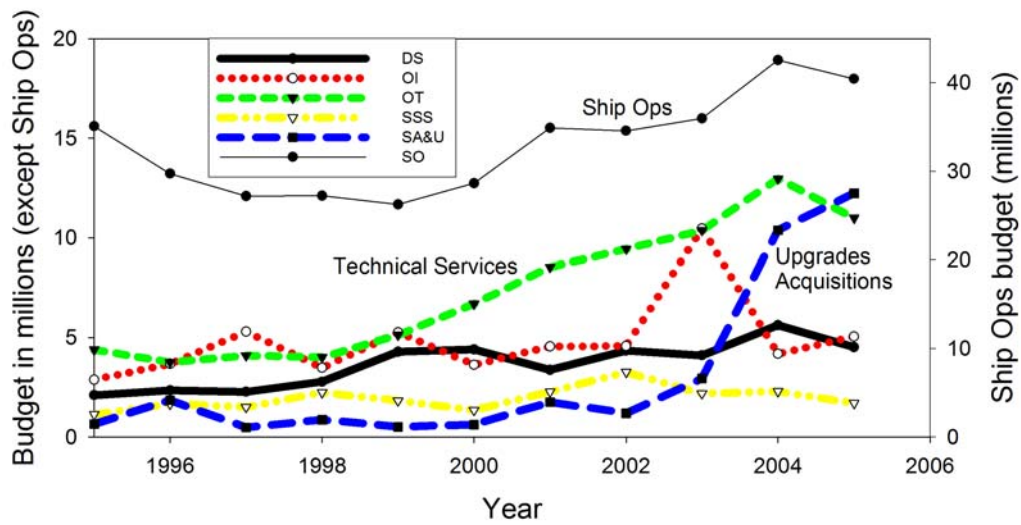
Introduction to Findings/Recommendations

The NSF Ocean Sciences Division (OCE) Committee of Visitors (COV) finds that the programs in the Integrative Programs Section (IPS) are well managed and efficiently run. Dedicated program directors have successfully administered proposals. These sea-going facilities provide the platforms that support most of the research in oceanography carried out by the US academic community. Access to the sea on University National Oceanographic Laboratory System (UNOLS) ships, supported by OCE, supports basic research whose goal is to better understand all aspects of the ocean, including its fundamental biological, chemical, geological and physical processes, both regional and global scales

A long term vision for the seagoing needs of the U.S. research community has been articulated by reports and advisories set up by a variety of agencies over a number of decades. Most recently, the U.S. Commission on Ocean Policy responded to a congressional mandate to set

up a national ocean policy due to the perceived decline of the nation's oceans and coasts. The commission's report (dated September 2004) recognized "America's oceans and coasts are priceless assets". It stated "The future success of ocean and coastal research, management, enforcement, and observations in the United States will depend on the availability of modern ships, undersea vehicles, aircraft, satellites, laboratories and observing systems, as well as the continuous development and integration of new technologies into these facilities". The Bush Administration's Response to the U.S. Commission on Ocean Policy (The U.S. Ocean Action Plan) "outlines the fundamental components ... which together provide the foundation to advance the next generation of ocean, coastal and Great Lakes policy". It describes "the development of a National Oceanographic Fleet Renewal Plan " that "will provide a vision for the future composition and size of the fleet to meet projected needs for research, for deployment and operation of observing systems, and for agency mission-oriented oceanographic operations". The Division of Ocean Sciences has taken a significant leadership role in planning and/or funding the construction of modern, technologically advanced ships and deep submergence vehicles to replace older, less efficient fleet assets. The IPS personnel have been essential contributors to the Federal Oceanographic Facilities Committee's development of the draft Federal Oceanographic Fleet Renewal Plan: 2005-2025 currently being reviewed and coordinated between the UNOLS Fleet Improvement Committee and the federal agencies that have a direct interest in the activities of oceanographic research and survey vessels.

In the IPS program at NSF, the major Program challenges over the last few years have included the increased costs associated with operating ships/facilities (these include fuel costs, fringe benefits, environmental impact assessment and security issues brought on by 9/11) and planning for fleet renewal. In addition there have been issues relating to the introduction of new facilities such as the Ocean Observatories Initiative that are proposed to begin to come online in 2007-2012). To provide a better perspective on the financial situation in IPS, the COV requested budget information to show the costs within the Section, information that was provided by the staff and is shown below in graphical format. The top panel shows the budget for the 6 components, Ship Operations (SO), Oceanographic Technical Services (OT), Ship Acquisitions and Upgrades (SA&U), Deep Submergence (DS), Oceanographic Instrumentation (OI), and Ship Support Services (SSS) from 1995 to 2005. Ship Operations has historically dominated the budget although over the last few years Technical Services and Acquisitions and Upgrades have played increasingly larger roles. The data suggest that, barring any increases in the other three programs, the Section (and Division) must look to the first three components for significant cost savings. A comparison of the total IPS facilities budget with the total OCE budget is shown in the middle panel. These two time series track each other closely. Over the last ten years the IPS facilities budget has accounted for 20-25% of the total OCE budget. IPS represented about 25% at the beginning of the time series in 1995, decreased to 20-21% for the next 7-8 years, increased to 24% in 2004 and remained at that level in 2005. The increases in the Ship Acquisition and Upgrades budget together with increased ship operating costs account for the increase over the last two years. The bottom panel shows the relative proportion of each of the programs to the total IPS budget. While Ship Operations represents the largest fraction, that fraction has been steadily decreasing over the last 10 years from around 75% in 1995 to around 55% in 2005. The Technical Services and, Acquisition and Upgrades programs have increased their proportion to about 15% while the other programs have retained a somewhat constant fraction. The increases in the Technical Services budget have been driven by the inclusion of shipboard oceanographic technicians in the IPS budget (prior to around 1999 these costs were not standard, with some ships charging them and in other cases being supported out



Top panel shows the funding history for programs reviewed by the COV (actual dollars). The middle panel shows the total Facilities budget compared to that of the total Ocean Sciences Division. The bottom panel shows the ratio of the individual programs to the total Facilities budget. Note that each graph has a left and a right axis so that all data can be well visualized.

of research budgets) and the costs of operating specialized equipment such as towed undulating vehicles. The increases in the Acquisitions and Upgrades include the RV *Ewing* and *Alvin* replacements, as well as planning for the Alaska Regional Research Vessel (AARV) and the Regional ship replacements.

A detailed description of the COV Findings and Recommendations follows.

Findings and Recommendations

Maintaining and renewing the existing facilities. The COV lauded the IPS staff for keeping its focus on the future needs of the ocean going community, even in times of fiscal uncertainty. The long-term maintenance of the fleet, through upgrades of existing facilities and new acquisitions, as well as the provision of major equipment for use by the research community, is essential for the health of the nation's science, educational and business interests.

Quality and vision of the staff. The committee found the handling of ship acquisitions and upgrades to exemplify the skill and creativity of operations within the IPS section of the Ocean Science Division. During the period under review, 4 major efforts have been advanced, in addition to the maintenance of normal operations of the existing fleet. These major projects reflect the priorities set by those of the larger oceanographic community during many years of discussion and planning (see above). One of the major advances has been the acquisition of a modern seismic vessel, the *R/V Langseth*, which will be capable of 3-d imaging of the ocean floor and provide a significant improvement over the current 2-d capability. This Global -class ship, through a Cooperative Agreement between NSF and Lamont Doherty, was purchased from the industry and will serve as a national facility to be heavily used by the marine geology and geophysics community, but will also serve ocean scientists from other disciplines. This acquisition represented a cost effective alternative to a ship upgrade and was an unsolicited proposal by the academic ship-operating institution (Lamont) that had operated the fleet's former seismic vessel, the *R/V Ewing*. . During the review process NSF selected an unusually broad array of academic, industry and agency reviewers and, in conjunction with the reviewer community, developed a unique oversight structure to handle the concerns of the potential users, relating to both the upgrade process and the subsequent operation of the vessel. Another major action during the period used an entirely different process to begin the acquisition of new regional class vessels: a Memorandum of Understanding between NSF and NAVSEA to begin the articulation of design requirements and construction plans for 3 future NSF-owned vessels, with the ship construction ultimately to be carried out by outside contractors. The third major activity was the initiation of the process that will ultimately lead to the construction of an *Alvin* replacement. In this case, the *Alvin*-operating institution (Woods Hole Oceanographic Institution) submitted an unsolicited proposal that responded to previously defined guidelines from a host of NSF-funded community workshops on the design of a new human occupied vehicle (HOV). The proposal then underwent extensive review and when approved, NSF again set up an advisory committee to insure that community needs and expectations were met during the design phase. . Lastly, the long-discussed planning for the construction of an Alaska Regional Research Vessel (ARRV) was advanced through the funding of design plans overseen by the former operator of the NSF-supported regional vessel, the *R/V Alpha Helix* (the University of Alaska). This unsolicited proposal was awarded after review and the planning process received input from an NSF-designated community of experts, to ensure that the ship broadly serves the community needs for Artic regional research. In each case NSF's 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. During a period of level or declining funding, as during the latter part of the review period (and possibly into the near future), there is a special challenge to maintain the integrity of the core science programs as well as the facilities required to conduct basic research. Especially during recent times, it has become clear that maintaining the same level of function requires increased spending: examples include the increasing costs of health benefits in supporting budgeted personnel, and the escalating fuel costs of ship operations. Additionally, costs are added as new services become essential or are mandated: for example, after 9/11, the costs of security at ship facilities have increased, and with the concerns about seismic operations potentially harming marine mammals, a host of environmental protection activities must now be instated. With no increases in budget, these expenses reduce the amount of money available for basic research (i.e. non IPS programs). These constraints are the basis for many of the questions and concerns raised by this COV, as it reviewed IPS.

OTIC should be reviewed along with the other IPS facilities. Current efforts and future plans relating to new facilities of critical importance to the ocean science community, such as the Ocean Observatories Initiative, are managed under the Ocean Technology and Interdisciplinary Coordination (OTIC) Program within the Integrative Programs Section. This COV was not asked to review OTIC and it found this resulted in significant difficulty understanding and evaluating the level of planning for future facilities being conducted by the IPS management. The COV found itself needing information about the activities supported in OTIC, activities that respond to some of the broader, forward-looking needs of the ocean science community. During discussions with the IPS program staff, the COV was occasionally told that the COV's concerns (see below) were being addressed (to an extent, at least) by the OTIC programs: this inability to have a real overview of facilities plans for critical new operations was perceived as limiting the ability of this COV to address the advisory role with which it was charged.

Maintaining an open process for future upgrades and acquisitions. A major goal of IPS is to effectively manage the acquisition and upgrade of seagoing research vessels in order to maintain the research fleet capabilities over the long term. The COV notes that this process has been ongoing in the years covered by the present review. The approaches used by NSF have been very effective, tailored to the situation, and very creative. A reading of the documentation and reviews for these acquisitions, however, shows that NSF must remain vigilant to insure the processes are open to community input and perceived as being fair. For instance, an institution that currently operates a vessel that will be decommissioned should not be perceived as being the institution that will necessarily house that vessel's replacement: the choice of operator needs to be open to competition and community review. Additionally, great care must be taken with unsolicited proposals from institutions that request major funding for vessel planning and construction (or major upgrades): if a major community resource is to be funded by NSF, the best fit may arise from an open solicitation that provides a variety of options to meet the community's need.

Corporate knowledge of IPS Facilities staff. The COV noted the very impressive skills and cumulative knowledge of program directors and their key staff within the IPS section. There was a concern that this "corporate knowledge" be maintained within the program as natural attrition occurs from retirements and other staff departures. Additionally, the increased workload due to the same factors that are driving facilities cost upward (e.g. from increased needs for security and endangered species issues) likely increases the stress of the workplace and may contribute to staff losses. The COV recommends that IPS examine the current workload and plan for the personnel losses that must inevitably occur, to insure that the quality of life of the workforce is

maintained and the cumulative experience and “wisdom” is passed on to the next generation of staff.

Streamlining the tracking of maintenance and upgrades of research vessels. Although post-cruise assessments by ship users are apparently conveyed to contract inspectors, follow-up on the resultant actions does not appear to be clearly documented and tracked. The COV recommends that a more formal or rigorous procedure be instituted to insure that deficiencies or problems noted in the assessments are tracked until remedied.

Increasing cost effectiveness. As encouraged by the 2002 COV, bulk purchases for equipment are being made by IPS in a number of situations. This COV applauds the practice and recommends this mechanism be used as much as possible to increase efficiencies, especially in an era of budget constraints.

Considering facilities costs as part of the scientific review process. The COV recommends that external reviewers of OCE proposals be provided with the true costs of funding requests that utilize facilities operated by IPS. That is, if ships or other facilities are required to conduct a research project, the overall costs of the grant, including both basic research budgets and IPS-covered costs should be made available in a merit review. When divisional budgets are constrained, the reviewer should be allowed to understand the real costs of a proposal under consideration.

Automating the ship scheduling process. A major effort is required by the IPS staff to arrange ship schedules for funded proposals, considering their various needs for particular study locations and, sometimes, season of study. The COV recommends that staff consider the improved efficiencies that could result from the use of automated (electronic) scheduling tools that are now available.

Dealing with new types of facilities required by the community. As iterated by the previous COV, by several FOFC reports, and by other community based bodies responding to the long term vision of the ocean research community, there is a need for new platforms other than the current fleet of research vessels now supported by NSF. These platforms will include gliders, buoys, autonomous underwater vehicles (AUVs) and other major facilities that allow the research community to obtain continuous, long-term measurements and other data not efficiently obtained from vessels that have been the subject of long-term fleet plans. The COV was told that some of these concerns are being addressed in another IPS section, namely OTIC (see above), but the full weight of this planning did not appear to be taken as seriously as needed for the health of the ocean science community. Indeed, discussions with the IPS staff indicated that another model might be required, as – for example – the one used for the ocean drilling program. In comparison with the very proactive stance taken by IPS to protect the long-term health of the fleet of research vessels, the concern about these other platforms appears to be considerably less forward looking. The COV urges the IPS section to work with other agencies in the Ocean Science Division to find a venue to proactively plan for these future needs of its research community.

Response to Previous COV Report

The 2002 COV on the OCE Integrative Programs Section made a number of recommendations. The overall intent of these suggestions, as stated in the previous COV report, was to “help insure that the next COV can meet its duties as fully and effectively as possible”. This COV

supports these recommendations and suggests they all be implemented for the next COV review. Below, we list the recommendations of the 2002 COV, concur with them and note the NSF response to each recommendation in the intervening 3 years.

Program officials might consider applying Cooperative Agreements to other activities that are considered routine undertakings.

This recommendation is being implemented.

NSF needs to provide a clearer definition of the relevant criteria and delimiting guidelines for submission of shipboard facilities and ship operations proposals.

This recommendation was implemented.

OCE is to be commended for its insight and leadership in use of group purchases of shipboard equipment for cost saving and standardization across the fleet. The COV recommended that this management practice be applied in other areas as well.

This recommendation is being implemented and this COV recommends continued expansion of this practice.

The COV recommended that NSF support the development and maintenance of a centralized, web-based tool for tracking training throughout the community of UNOLS ships' crews.

This recommendation is being implemented.

Post-cruise UNOLS assessments, which provide ample opportunity for subjective interpretation, may not be appropriate for rigorous analytical use. It may be necessary for NSF to develop more rigorous measures of efficiency and quality of service.

This recommendation is being addressed.

Web based tracking of compliance with recommendations of UNOLS ship inspections should be considered.

This recommendation is being implemented, though this COV review recommends acceleration of the process.

Review of the proposal jackets found that program decisions were generally well documented. When questions arose regarding decision making, the missing component was usually identified as information that was passed on to proposers or awardees during an informal contact. _Diary notations of such contacts would greatly increase the "readability" of program jackets. The previous COV (1997) made a similar comment.

This recommendation was implemented.

The previous COV identified a need to address the growing range of additional platforms and sensors now available and recommended that NSF define new program areas to address these existing and emerging capabilities.

This recommendation has not been addressed. Furthermore, in the few years, additional challenges regarding escalating ship operation costs have arisen, which will also require consideration.

Response to the IPS Charge: The COV Template

FY 2005 REPORT OF THE NSF COMMITTEE OF VISITORS (COVs) TO IPS

Date of COV September 14-16, 2005
Program/Cluster: Integrative Program Section
Division: Ocean Sciences
Directorate: Geosciences
Number of actions reviewed by COV¹: Awards: 92 Declinations: 10 Other:2
Total number of actions within Program/Cluster/Division during period being reviewed by COV²: 2003-2005 Awards: 270 Declinations: 30 Other:6
Manner in which reviewed actions were selected: Small number of proposals so all reviewed.

PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

The charge to the committee was to briefly discuss and provide comments for *each* relevant aspect of the program's review process and management.

A.1 Questions about the quality and effectiveness of the program's use of merit review procedures. The COV uses the table provided to respond to the questions listed.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE ³
<p>1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits) Comments: IPS is unlike many other NSF programs; the intellectual merit is not the primary review criterion for facilities, operations and equipment. IPS does, however, use an appropriate mix of mail reviews, panels, site visits/inspections and community involvement in its reviews of proposals.</p>	YES
<p>2. Is the review process efficient and effective? Comments: The COV was particularly impressed with the community input and thoroughness of reviews, review analyses and panel reviews. With respect to major new acquisitions (e.g./V Langseth acquisition and Alvin</p>	YES

¹ To be provided by NSF staff.

² To be provided by NSF staff.

³ If "Not Applicable" please explain why in the "Comments" section.

replacement), the establishment and use of oversight committees and outreach to other agency partners is highly commended.	
3. Are reviews consistent with priorities and criteria stated in the program's solicitations, announcements, and guidelines? Comments:	YES
4. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation? Comments: In most cases the reasons were clearly articulated in reviews.	YES
5. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation? Comments: When available, the panel reviews and summaries were very good and thorough, overall.	YES
6. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation? Comments: The COV concurred that the diary notes and review analysis in the e-jackets provided were very thorough and informative in general. This information clearly addressed one of the shortcomings identified in the 2002 COV.	YES
7. Is the time to decision appropriate? Comments: Yes, in general. However, the COV recognized that some proposals such as those that involve complex scheduling, present additional challenges for early decision making; especially where multi-agency decisions and additional community input are required.	YES
8. Discuss any issues identified by the COV concerning the quality and effectiveness of the program's use of merit review procedures: As described elsewhere in this report, the reviews appear to be well handled.	

A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers..

IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE ⁴
<p>1. Have the individual reviews (either mail or panel) addressed both merit review criteria? Comments: While the review criteria were addressed, the COV recognized that intellectual merit is not a primary review criterion for the IPS proposals</p>	YES
<p>2. Have the panel summaries addressed both merit review criteria? Comments: As stated above, intellectual merit is not a primary review criterion for the IPS proposals</p>	YES
<p>3. Have the <i>review analyses</i> (Form 7s) addressed both merit review criteria? Comments: As above (1 and 2)</p>	YES
<p>4. Discuss any issues the COV has identified with respect to implementation of NSF's merit review criteria. The generic review criteria do not directly pertain to IPS. The COV recommends that perhaps the template be modified for the IPS COV so that additional review criteria are more aligned to the IPS mission in the future, drawing, for example, from concerns expressed in recent UNOLS and FOFC documents.</p> <p>The COV recommends that care be taken regarding the handling of unsolicited proposals. To prevent any perceptions by the community that this is not an open competitive process, community input for these proposals should always be solicited early in the process.</p>	

⁴ In "Not Applicable" please explain why in the "Comments" section.

A.3 Questions concerning the selection of reviewers.

SELECTION OF REVIEWERS	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE ⁵
<p>1. Did the program make use of an adequate number of reviewers? Comments: In particular, in the large acquisition/development proposals such as that for the new HOV, numerous reviewers with the full range of expertise and qualifications were used. In general on the smaller ship operations and upgrades fewer but sufficient reviews were obtained.</p>	YES
<p>2. Did the program make use of reviewers having appropriate expertise and/or qualifications? Comments: .</p>	YES
<p>3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups? Comments: Yes, to the degree possible for this program.</p>	YES
<p>4. Did the program recognize and resolve conflicts of interest when appropriate? Comments: Yes. The reviews for the larger proposals were impressively attentive to differences of opinion expressed by the various reviewers.</p>	YES
<p>5. Discuss any issues the COV has identified relevant to selection of reviewers. In order to prevent the perception that certain institutions will benefit preferentially, the COV recommends NSF be very careful in their choice of reviewers for the selection of operators for regional ships and the ARRV.</p>	

⁵ If “Not Applicable” please explain why in the “Comments” section.

A.4 Questions concerning the resulting portfolio of awards under review.

<p style="text-align: center;">RESULTING PORTFOLIO OF AWARDS</p>	<p style="text-align: center;">APPROPRIATE, NOT APPROPRIATE⁶, OR DATA NOT AVAILABLE</p>
<p>1. Overall quality of the research and/or education projects supported by the program. Comments:</p>	<p>NA</p>
<p>2. Are awards appropriate in size and duration for the scope of the projects? Comments:</p>	<p>NA</p>
<p>3. Does the program portfolio have an appropriate balance of: <ul style="list-style-type: none"> • High risk projects? Comments:</p>	<p>NA</p>
<p>4. Does the program portfolio have an appropriate balance of: <ul style="list-style-type: none"> • Multidisciplinary projects? Comments:</p>	<p>NA</p>
<p>5. Does the program portfolio have an appropriate balance of: <ul style="list-style-type: none"> • Innovative projects? Comments:</p>	<p>NA</p>
<p>6. Does the program portfolio have an appropriate balance of: <ul style="list-style-type: none"> • Funding for centers, groups and awards to individuals? Comments:</p>	<p>NA</p>
<p>7. Does the program portfolio have an appropriate balance of: <ul style="list-style-type: none"> • Awards to new investigators? Comments:</p>	<p>NA</p>
<p>8. Does the program portfolio have an appropriate balance of: <ul style="list-style-type: none"> • Geographical distribution of Principal Investigators? Comments:</p>	<p>NA</p>

⁶ If “Not Appropriate” please explain why in the “Comments” section.

<p>9. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Institutional types? <p>Comments:</p>	NA
<p>10. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Projects that integrate research and education? <p>Comments:</p>	NA
<p>11. Does the program portfolio have an appropriate balance:</p> <ul style="list-style-type: none"> • Across disciplines and subdisciplines of the activity and of emerging opportunities? <p>Comments:</p>	NA
<p>12. Does the program portfolio have appropriate participation of underrepresented groups?</p> <p>Comments:</p>	NA
<p>13. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.</p> <p>Comments:</p> <p>The program makes specialized facilities available to the larger scientific community and plays a very important role in meeting national priorities, agency needs and science community needs. These national priorities and community needs have been articulated, for example, in:</p> <p>NRC Future Needs in Deep Submergence Science Report US Commission on Ocean Policy Report US Ocean Action Plan</p>	YES
<p>14. Discuss any concerns relevant to the quality of the projects or the balance of the portfolio.</p>	

A.5 Management of the program under review. Please comment on:

1. Management of the program.

Comments: The IPS program is well-managed by a hard working staff and section head who use innovative approaches to deal with many challenging issues in maintaining and expanding the facilities and support for the ocean science community.

2. Responsiveness of the program to emerging research and education opportunities.

Comments: The program is very flexible in finding ways to take advantage of o/opportunities for timely research and accommodating unplanned time critical studies. A recent example is MIPS's enabling of the deployment of *R/V Cape Hatters* to the Gulf of Mexico in the aftermath of Hurricane Katrina.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.

Comments: Planning and prioritization for renewal of existing program assets has been excellent: the replacement of the *R/V Ewing*, planning for the AARV and regional class vessels, and the *Alvin* replacement. Coordination with FOFC and UNOLS is to be commended as is their leadership in the fleet renewal process.

4. Additional concerns relevant to the management of the program.

Comments: The COV noted the lack of longer term vision and proactive planning regarding new challenges such as:

1. Increasing costs for ship operations in a climate of level and decreasing budgets.
2. Addressing the needs for accommodating new platforms and technologies into the national infrastructure (e.g. ABE, HROV, OOI, AUVs/Gliders, HOVs).

PART B. RESULTS OF NSF INVESTMENTS

The charge to this COV committees in this section of the review process is largely focused on program responses to the science mission of the proposals. In the case of the present review, however, the focus is on the responsiveness of the IPS program to community needs for facilities. Hence, there is considerable mismatch of the questions, below, with the IPS program role (as noted above in section A4).

B. Please provide comments on the activity as it relates to NSF’s Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

B.1 OUTCOME GOAL for PEOPLE: Developing “a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens.”

Comments: not relevant to this COV

B.2 OUTCOME GOAL for IDEAS: Enabling “discovery across the frontier of science and engineering, connected to learning, innovation, and service to society.”

Comments: not relevant to this COV

B.3 OUTCOME GOAL for TOOLS: Providing “broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation.”

Comments:

The basic function of this program is to provide facilities for access to the ocean that are used to enable discovery. Management systems developed by these programs enhance productivity by transparently coupling science proposals to facilities access via the ships of the UNOLS fleet. The programs have done an excellent job in terms of providing platforms and ship board facilities.

B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing “an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices.”

Comments:

The IPS Section provides leadership and vision for supporting many of the facilities aspects of the oceanographic research community. Business practices used by the IPS program, such as group purchases that result in increased efficiency and reduction in ownership costs are applauded by the COV. NSF facilitates the research activity of more than 60 institutions through enabling broad access to over 25 ships and specialized equipment. The COV recognizes the importance the program places upon involvement of the user community in identifying requirements for new facilities and maintaining/upgrading existing facilities.

PART C. OTHER TOPICS

C.1 Please comment on any program

The COV was concerned with maintaining the balance between research and facilities during periods of budget shortfalls (e.g. competition between support for research vs. facilities) and the need for identifying efficiencies not previously considered (see above)

C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

The COV was concerned with the lack of a proactive approach to planning for incorporation of new technological capabilities and platforms into the national infrastructure. For example, the source of funding and oversight for these new capabilities is not yet clearly positioned in science or operations entities in Ocean Sciences

C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

See recommendations above.

C.4 Please provide comments on any other issues the COV feels are relevant.

Same as C. 3

C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.

The quality and availability of materials provided were excellent. However, for this COV, the effectiveness of the process was significantly diminished because the electronic delivery of the COV supporting documents transferred the burden for acquiring these documents to the panel members themselves.

The COV recommends a small introductory section be made available to advise COV members on the most critical or useful sections/documents to obtain an overview of the voluminous material provided: for instance, directing the reviewers to the Review Analysis and the Panel Review Summaries provides an excellent overview of many proposals.

Additionally, it is recommended that all documents pertaining to each proposal be made available to the COV as a single downloadable pdf file (much like 'Print entire proposal vs. individual downloadable sections).

SIGNATURE BLOCK:

For the Ocean Sciences Division COV
Mary W. Silver, Chair

For the Ocean Sciences Division COV
Francisco P. Chavez, Co-Chair