

COMMITTEE OF VISITORS REPORT

ON THE

POLAR RESEARCH SUPPORT SECTION

OFFICE OF POLAR PROGRAMS

NATIONAL SCIENCE FOUNDATION

Review Period: 1998, 1999, and 2000

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ACRONYMS

AMANDA.....	Antarctic Muon and Neutrino Detector Array
ARO	Atmospheric Research Observatory
ASA.....	Antarctic Support Associates
CEP.....	Committee on Environmental Protection
COV	Committee of Visitors
DASI.....	Degree Angular Scale Interferometer
GPRA.....	Government Performance and Results Act
NSF.....	National Science Foundation
OAC	Office Advisory Committee
OPP	Office of Polar Programs
ORW	Operational Requirements Worksheet
PRSS	Polar Research Support Section
RSP	Research Support Plan
RPSC.....	Raytheon Polar Services Company
SIP.....	Support Information Package
SPRESO.....	South Pole Remote Earth Seismic Observatory
SPSE	South Pole Safety & Environment
SPSM	South Pole Station Modernization
USAP	United States Antarctic Program

EXECUTIVE SUMMARY

The performance of the National Science Foundation's Polar Research Support Section (PRSS) is most directly judged by assessing the effectiveness of the Office of Polar Programs (OPP) in accomplishing its primary mission ~ conducting science in Antarctica. While research support operations can and will be judged on metrics of efficiency, productivity, on-time performance, and cost effectiveness, it is the more intangible measures related to the quality, impact, and relevance of Antarctic science that the success of PRSS should ultimately be judged against. In all measures of performance, it is the Committee of Visitors' assessment that Antarctic science is strong, it is relevant, it is cutting edge, and it is by far the best being performed in the world today. The Committee, therefore, concludes that PRSS is accomplishing its major objectives as reflected in the state and health of U.S. Antarctic science. Given the challenging environment, the complex network of stations and facilities, the fleets of vehicles of all kinds, the extensive infrastructure, supply lines that extend virtually around the world, and not least of all, the human resources provided by PRSS, it is even more impressive that their presence is often taken for granted by the ultimate end users - the National Science Foundation-supported scientists. The question must be asked; could the accomplishments of the scientists be achieved if PRSS were not there ~ the answer is clearly no.

The Committee of Visitors (COV) reaches these conclusions based in part on the recent COV Report on the OPP Science Programs and, in part, on personal experiences. The Science COV reviewed the outputs and outcomes of the National Science Foundation's investments and concluded that the portfolio of research projects supported by OPP is very good. It consists of projects in almost every field of science and includes exciting examples of innovation. While it was noted that some projects can only be conducted in the polar regions and have primarily polar significance, many projects contribute fundamental knowledge to understanding global processes, such as climate change, far beyond the region where the studies are conducted. The Science COV Report says it best:

"...Office of Polar Programs has excellent program performance in terms of discoveries at and across the frontiers of science and engineering... the breadth and scientific impact of the discoveries are outstanding. Significant discoveries have been made in both disciplinary and interdisciplinary studies...long-term data sets (have)... contributed directly to major discoveries...."

Discoveries include enhancing our understanding of the behavior of the earth system, providing cosmological insights into the origins of the universe, and documenting ecosystem responses to climate change. Specific important discoveries include: measurement of cosmic microwaves generated at the time of the creation of the universe, recognition of recent major fluctuations in sea ice cover, revision of our understanding of atmospheric sulfur chemistry, recognition of ancient volcanic eruptions in the Ross Sea, and the mapping of sub-glacial lakes under more than four kilometers of the East Antarctic ice sheet. The creation of new knowledge and techniques within and across traditional boundaries as a result of OPP awards and PRSS support include: descriptions of global scale primary productivity, definition of the role of clouds in atmospheric warming and melting of sea ice, discovery of fish anti-freeze genes that link evolution with climate history, and the use of Antarctic ice as a detector of high energy particles. It is clear that these discoveries required substantial and complex logistical support from PRSS and the excellence of the science produced says volumes about the effectiveness of PRSS.

This Committee of Visitors report concludes that: a) the science support provided by PRSS is unsurpassed, b) PRSS has met the many and varied requirements of complex and challenging projects over a wide range of scientific disciplines each with their own unique logistical considerations, and c) PRSS is an essential and critical element in a process that has produced significant new knowledge.

The Committee of Visitors developed the six specific, major recommendations summarized below. More detail regarding these recommendations can be found in the body of this report.

1. Streamline the Logistics Planning Process
2. Take a Leadership Role in Implementing the Antarctic Environmental Protocol

3. Upgrade Deep Field Science Infrastructure
4. Create a Recurring Repair and Replacement Account
5. Consolidate Aviation Contractor Management Functions
6. Improve the Committee of Visitors Process

1.0 THE PROCESS

The 2001 Polar Research Support Section (PRSS) Committee of Visitors (COV) convened on September 6 and 7, 2001 at the National Science Foundation (NSF) offices in Arlington, VA. The committee charge was to evaluate the performance of PRSS for 1998, 1999 and 2000 in terms of both nine specific questions provided by the Office of Polar Programs (OPP) Office Advisory Committee (OAC) and the NSF-wide Government Performance and Results Act (GPRA) guidelines for performance review. The Committee reviewed the charge with Karl Erb, Director of OPP, and Altie Metcalf, OPP Budget and Planning Officer. Eric Chiang, Director of PRSS, presented an overview of PRSS activities for the review period. The Committee organized the nine PRSS-specific questions and the GPRA questions into four major focus areas and addressed these questions in the context of PRSS' performance over the review period. The specific questions presented to the COV by the OPP OAC can be found at the end of this report.

1.1 Focus A “*Setting Science Support Priorities and Environmental Stewardship*”

The goal of discussions in this focus area was to evaluate the process PRSS uses to set priorities in light of the needs and requirements of the research community. The review and discussions also considered the environmental aspects of the PRSS program. This focus area encompasses the charge to the committee as addressed in Questions 1, 3, and 8.

1.2 Focus B “*Resource Balance Between Support for Science Programs and Infrastructure Upgrade and Maintenance*”

The goal of the discussions in this focus area was to evaluate the balance of resource commitments to science programs and infrastructure as well as the effectiveness of the management of the South Pole Station Construction Projects. This focus area encompasses the charge to the committee as addressed in Questions 2 and 7.

1.3 Focus C “*Tasking, Oversight and Review of Contractors - Both Governmental and Private*”

The goal of discussions in this focus area was to evaluate the effectiveness of the relationship between PRSS and OPP contractors including tasking, oversight, and performance review issues. The committee also assessed the appropriateness of the basic mix of contractors and federal agencies that support OPP. This focus area encompasses the charge to the committee in Questions 4, 5, and 6.

1.4 Focus D “*Government Performance and Results Act and the Polar Research Support Section Committee of Visitors Process*”

The goal of this focus area was to review the applicable NSF-wide GPRA goals and present ideas on ways to improve the COV process.

A detailed analysis of each focus area was performed by the COV resulting in six specific major recommendations. The major recommendations are included within the following discussion for each focus area. The discussions also contain other recommendations developed by the committee during their deliberations.

2.0 DISCUSSION OF THE FOCUS AREAS

2.1 FOCUS A “*Setting Science Support Priorities and Environmental Stewardship*”

2.1.1 *Efficiency of the Logistic Planning Process*

The COV believes that support planning and effective implementation are inextricably linked and therefore dealt with the two questions related to these issues together. The Committee’s general perception is that the planning process, which operates per the scheme:

Operational Requirements Worksheet (ORW)→
Support Information Package (SIP)→
Research Support Plan (RSP)→
Field Support→
Out-brief

is working reasonably well but could be performed more efficiently. The COV that met in July 2000 to review the OPP Science Program was greatly impressed by the quality of polar science, which certainly reflects positively on both the Science Sections (Antarctic and Arctic) and PRSS. Examples of successful PRSS performance include:

- a. After receipt of proposals on June 1, PRSS delivers preliminary logistics assessments of each to Science Program Managers by October 1.
- b. The ORW is used to determine the estimated logistics requirements of a proposal and to limit the ballooning of logistical requirements at the SIP stage.
- c. Grantee out-briefs are used to assess contractor performance and to improve science support for future years.
- d. Station and Vessel Users' Committees have been very effective in advising the primary OPP support contractor (both Antarctic Support Associates [ASA] and Raytheon Polar Services Company [RPSC]) and, indirectly, PRSS on infrastructure issues.

Presently, PRSS develops preliminary logistic assessments on 100 percent of the proposals submitted to OPP even though a large number of proposals are ultimately declined based on scientific merit. Reviewing every proposal places an undue burden on the staffs of PRSS and RPSC. Excluding proposals that have little or no reasonable chance of funding from the logistic review process would enable PRSS and Raytheon personnel to develop more detailed logistic analyses for those proposals that are most likely to be awarded. An early culling process would eliminate unnecessary work and ultimately result in more planning time for those projects that actually end up in the field.

Major Recommendation 1: “Streamline the Logistics Planning Process”

PRSS should develop procedures that will reduce the number of proposals that undergo unnecessary logistic reviews.

The COV developed a number of other recommendations based on their evaluation of the logistics planning process.

2.1.1.1 New Proposer Workshops

The recruitment of the next generation of Antarctic scientists is presently hampered by the perceived complexity of the logistic planning process by newcomers. The COV took note of the New Proposer Workshop as one mechanism to educate the science community on the process. The COV recommends that PRSS, in conjunction with the Science Support Section, continue such workshops so that logistic complexities do not deter potential new investigators either before or after an award is made. These workshops would also help reduce the submission of improperly prepared ORWs and SIPs, which create a significant drain on the productivity of PRSS staff.

2.1.1.2 Users Groups

The COV strongly encourages PRSS to continue their liaison efforts with the User Groups. To enhance scientific input to support planning and management, the COV recommends that PRSS ensure that User Committee Reports are made available to the OPP OAC and, as appropriate, to COVs.

2.1.1.3 Improved Data Exchange

The entire Support Planning Process would be greatly simplified and enhanced by the development of a seamless data exchange and management tool. The COV endorses PRSS's efforts to facilitate this initiative. Furthermore, PRSS is encouraged to use science program out-briefs to preview SIP requirements for the coming season. The ability of PRSS to generate early forecasts of logistic requirements should lead to efficiencies in procurement and transportation.

2.1.2 *Environmental Stewardship*

The COV found that PRSS stewardship of the Antarctic environment over the past three years has been exemplary. Through its efforts, PRSS has made environmental awareness an

integral part of the United States Antarctic Program (USAP) culture. In many ways, USAP can be held up as a model of environmental awareness. Examples of successful PRSS performance, each supported by NSF documentation, include:

- a. Refinement and improvement in the comprehensive waste management and recycling program.
- b. Development of environmental monitoring programs.
- c. Implementation of environmental remediation efforts.
- d. Initiation of a fuel conservation program.
- e. Investment in measures to prevent and respond to environmental accidents.
- f. Documentation of environmental compliance.

The entry into force of the Antarctic environmental protocol in 1998 has had and will continue to have a major impact on USAP and, in particular, on its logistical operations. The protocol created the Committee on Environmental Protection (CEP), which will be a focal point for environmental issues within the Antarctic Treaty System. PRSS currently provides the U.S. representative to the CEP and the COV believes it is both necessary and desirable for PRSS to play this role as long as the USAP environmental programs reside under PRSS management. Effective performance of this role has significant resource implications. For example, the CEP representative will need to be involved in significant international negotiations and oversee the development of management plans for designated special areas in the Antarctic.

Major Recommendation 2: *“Take a Leadership Role in Implementing the Antarctic Environmental Protocol”*

PRSS should play a proactive and international leadership role in the implementation of the Antarctic environmental protocol, in particular within the CEP. To accomplish this growing mission, OPP and PRSS should develop the funding and human resources needed.

2.2 **FOCUS B** “Resource Balance Between Support for Science Programs and Infrastructure Upgrade And Maintenance”

2.2.1 *The Balance of Science and Infrastructure*

On average, Antarctic science grants increased slightly during FY 98, 99 and 00 compared to FY 97, as did the proportion of the PRSS budget allocated to direct science support as opposed to infrastructure support.

	Funding in Millions of Dollars			
	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>
Antarctic Science	30.63	30.98	30.52	31.07
PRSS Direct Science Support*	40.72	40.10	41.16	44.13
PRSS Infrastructure	122.15	120.30	123.47	132.38
Support/Science Ratio	1.33	1.29	1.35	1.42

* 25% of total PRSS budget based on a prior analysis by PRSS staff that allocated helicopters, Twin Otters, 100 percent of Palmer ship time, 60 percent of L.M. Gould ship time, LC-130 science missions, all station laboratories, support equipment and materials, RPSC science support budget and science specific construction to “direct science support”.

Major infrastructure improvements and upgrades related to safety and science support were completed or in progress during the review period.

- a. South Pole Station: South Pole Safety & Environment (SPSE), South Pole Station Modernization (SPSM), Atmospheric Research Observatory (ARO), Viper Telescope, Degree Angular Scale Interferometer (DASI) Telescope, Antarctic Muon and Neutrino Detector Array (AMANDA), South Pole Remote Earth Seismic Observatory (SPRESO) planning and design.
- b. McMurdo Station: Mechanical Equipment Center (MEC), Sewage Treatment Facility, Berg Field Center (BFC) Plans, Science Cargo Upgrade Plans, New Power Plant Plans.
- c. Palmer Station: GWR Renovation, BioLab Renovation Planning.
- d. Vessels: R/V Nathaniel B. Palmer, Laurence M. Gould

Although major improvements were made to OPP Antarctic infrastructure during the three review years, the COV identified two critical trends. First, there was an absence of investment in deep field infrastructure; and secondly, there was (and still is) no long-term financial plan to support, replace, and repair OPP managed infrastructure.

Significant support and infrastructure-related unmet needs have and will continue to have an impact on deep field science. Most facilities and equipment are well beyond their useful lives (e.g., large structures are 1950s era, track vehicles and snow machines are 20+ years old, and energy production and use are inefficient). The age of the facilities impose significant inefficiencies with respect to maintaining adequate safety, environment, and health standards at the camps.

Major Recommendation 3: “Upgrade Deep Field Science Infrastructure”

PRSS should develop a long-range plan, funding strategy and implementation schedule to upgrade and support deep field science capabilities.

While long range infrastructure, upgrade, and improvement plans have been developed (e.g., McMurdo Master Plan, Fleet Management Plan), there is no consistent, reliable funding process for implementing these plans. To date, funding for infrastructure improvements has been on an *ad hoc* basis. A formal capital asset replenishment process, as previously recommended by the *Augustine External Panel* and the 1998 PRSS COV, has not been developed.

Major Recommendation 4: “Create a Recurring Repair & Replacement Account”

OPP should place a high priority on securing an overall NSF budget enhancement to establish a recurring PRSS infrastructure repair and replacement account.

2.2.2 Management of South Pole Station Construction Projects

Evaluation of the construction program at the South Pole was performed by independently evaluating the South Pole Safety and Environment (SPSE) and South Pole Station Modernization (SPSM) projects.

Based on data and information provided by PRSS staff, the COV identified the following significant findings:

- a. SPSE has been successfully completed. This \$25M project was delivered on time and on budget.
- b. The planning, design, and construction aspects of SPSM are being well managed.
- c. The impact of SPSM on science projects at the Pole has been less than anticipated.
- d. The impact of SPSM on science projects at other locations, specifically science programs in the interior, has been greater than initially anticipated.

Coordination and interface with the science community on SPSM design issues has been consistent, appropriate, and effective. The Aeronomy & Astrophysics Science Program Manager is a member of the Configuration Control Board, and a senior South Pole Station grantee attends design review meetings and coordinates specific science related concerns. PRSS has been proactive in minimizing disruption to South Pole science during construction and they have specific transition plans for moving into the new station that minimize the impact on science.

Sections 7.5 and 7.6 of the April 1997 *Augustine External Panel* summarized the rationale for replacing the existing South Pole Station and a funding strategy that included reduced science expeditions to the ice (off-set by more work in university laboratories in the U.S) and an overall cutback in research activity during construction of the facility (\$20M cumulative over the period FY98-FY02). Through proactive management, NSF/OPP/PRSS was able to secure the funds necessary to construct the new station without having to reduce science funding. Accelerated project funding has resulted in efficiencies in the procurement of material, equipment, and furnishings. The COV was also advised that the SPSM project includes state of the art building management systems and operation/maintenance protocols that will result in significant cost savings over the life of the new station. In addition, the committee understands that the transition from ASA to RPSC was smooth, with respect to SPSM, due in large part to PRSS initiatives related to personnel retention.

PRSS has minimized the impact of SPSM on science projects at the Pole by maintaining a minimum of 50 beds per season for science during the project. They have also allocated a minimum of twelve LC-130 missions per season to the Pole for science during the SPSM project.

The impact of SPSM on science projects at other locations, specifically science programs in the interior, has been greater than initially anticipated although PRSS and OPP have made major efforts to accommodate science projects when possible. For example, the SPSM project absorbed LC-130 mission shortfalls during the FY-00/01 season, which reduced the impact of these shortfalls on science. However, the COV noted that in April 1998 the science community was informed that “the impact of SPSM would continue through FY-01” (reference *Dear Colleague* letter from Dr. Hunt, Acting OPP Director, dated April 1998) and that current projections suggest that LC-130 science missions will not return to pre-construction levels until 2007. Creep in the SPSM schedule will impact science at other locations that are dependent upon LC-130 support.

The COV developed a number of other recommendations during their evaluation of this focus area.

2.2.2.1 Science Support Metric

PRSS should develop a measure of Direct Science Support so that the ratio of Science Support/Science can be consistently tracked. The committee recommends that the current support/science dollar ratio (as measured by the index referenced above) be maintained at approximately 1.4.

2.2.2.2 Office of Polar Programs Construction Policies

Initiatives already implemented as part of SPSM to minimize the impact on science should be continued for the life of the project. Future construction projects at the South Pole (and other locations) should adopt science protection measures similar to those implemented as part of SPSM. Cooperation between infrastructure and science-support activities to the mutual benefit of both should continue.

2.2.2.3 LC-130 Support

LS-130 mission shortfalls are an emerging trend based both on mission numbers for the period reviewed and projected LC-130 mission numbers through FY2006. PRSS should continue to explore options to increase LC-130 support for science prior to the completion of SPSM.

2.3 **FOCUS C** *“Tasking, Oversight and Review of Contractors - Both Governmental and Private”*

2.3.1 *Mix of Contractors*

The *Augustine External Panel* recommended that, “*To the greatest extent possible, all support activities in Antarctica should be placed under a single prime contractor -- with oversight by a single individual/office designated by NSF. Subsidiary organizational elements should be restructured to minimize overlap, duplication, and interfaces.*” An overall review of USAP and its’ transition from all military support to the current mix of government and contractor entities indicates that these changes have resulted in significant cost savings to the program. Changing the mix has also reduced the overall OPP footprint on the continent without any adverse impact with respect to OPP program goals.

Currently, RPSC is the prime OPP support contractor. RPSC is responsible for many functional areas and provides a wide array of services in support of the program including direct oversight of numerous subcontractors. The COV specifically considered the support and oversight of the flight operation subcontractors.

Oversight for air logistics support provided by *Ken Borek Air* Twin Otters, and the subsequent safety of those flight operations is the responsibility of RPSC. However, deployment inspections of those aircraft is the responsibility of the Office of Aircraft Services (OAS), a functional component of the U.S. Department of the Interior. Helicopter support for USAP is provided by *Petroleum Helicopters Inc.* (PHI). OAS, through a Memorandum of Agreement with PRSS, manages all aspects of the PHI contract. OAS has in-depth experience with respect to both aircraft contracting issues and aviation safety.

In light of the safety record of *Ken Borek Air* and other Antarctic operators under the supervision of RPSC, the COV believes that consolidating the management (safety inspections and general oversight of the flight services contract) for *Ken Borek Air* and *PHI* under OAS would result in improved flight operations in Antarctica.

Major Recommendation 5: “Consolidate Aviation Contractor Management Functions”

PRSS should consolidate the management of the private aviation contractors (PHI and Ken Borek Air) under a single Memorandum of Understanding with the Federal Office of Aviation Services to provide aircraft management services including safety inspections.

2.3.1.1 Outsourcing of Air Logistics Support

The COV cannot say enough about the significant contribution that military aircraft make to the overall program in Antarctica. However, the committee also believes there may be additional commercial outsourcing opportunities that could be of benefit to USAP (i.e., enhanced capabilities and/or lower costs). For example, there may be benefits to contracting with commercial carriers for additional logistics support or with civilian personnel to fly NSF-owned aircraft. Accordingly, the COV recommends the following:

PRSS and the OPP Contracting Section should periodically request statements of interest and summaries of available capabilities from the private sector with respect to USAP air logistics support.

2.3.2 *Performance Measures*

In accordance with the GPRA, PRSS has developed quantitative and qualitative measures of performance for the contractors and federal partners that provide support to OPP. These metrics have been derived over the course of the last three years. This is the third year that NSF has used this USAP-wide performance evaluation process. During this time, the major

prime contractor changed from ASA to RPSC. The committee concluded that PRSS is using appropriate performance measures.

2.3.3 Tasking and Oversight

Tasking and oversight of contractor activities has been a reoccurring issue for the past two COVs. The 1998 PRSS COV concluded that PRSS was not providing adequate contract documentation. Their conclusion was based on a review of the funding jackets. Although the current COV acknowledges that the funding jackets do not include all information relevant to the contract file, we note that additional supporting documentation can be found in the program and financial files. It is possible to get a comprehensive view of the contract status through a review of the funding jacket, program file, and financial reports. For example, contract modifications and advance payment documentation is found in the contract file; the contractor's monthly cost statements and quarterly technical reports are found in the program file. The contractor's report of government-held property is in the financial file. Taken together, these files may be considered the comprehensive contract file.

The previous COV recommended a single master file to include all documentation relevant to a given contract. This file would be under the control and responsibility of a single point of contact to be determined by PRSS and the OPP Contracting Office. The current COV finds this a reasonable idea in theory, but not feasible in practice. Given the fact that the Contracting Office holds responsibility for obligations and payments and the program offices are responsible for the daily oversight of contractor performance, it seems impractical and inefficient to consolidate or duplicate two sets of files when all the necessary information is already available for review.

While the official contract file held by the Contracting Office must contain sufficient documentation for contract administration and contract close out, it seems reasonable to reference supporting documentation both in paper form and electronically. Accordingly, the committee recommends the following.

2.3.3.1 Master File Index

Contract and program files should contain a master, cross-referenced index. This index would be an inventory of all relevant contract documentation from the initial identification of a requirement to contract close out. It should contain the reference information necessary to find tasking and oversight documents for anyone who may be new to a project. PRSS and the Contracting Office should continue to use electronic file storage for supporting documentation.

The index system should satisfy the need for ready identification and retrieval of all documentation relevant to a given contract or interagency agreement without incurring additional administrative costs. This type of system is consistent with the Paperwork Reduction Act in that it does not require significant duplication of paper.

2.4 **FOCUS D** “*Government Performance and Results Act and The Polar Research Support Section Committee of Visitors Process*”

2.4.1 *Government Performance and Results Act*

PRSS continues to be tremendously effective in supporting a broad range of science projects from astrophysics to microbiology. However, unlike the majority of NSF, PRSS is not directly involved with the development of ideas or the education of people. PRSS provides and maintains infrastructure throughout the continent and surrounding oceans so that NSF supported scientists can do these things. It is difficult to apply GPRA guidelines that were developed for NSF science programs to PRSS. Nonetheless, the COV determined that certain elements of the GPRA *Tools Strategic Outcome Goal* were relevant to PRSS responsibilities, and based on all the information summarized in the focus area discussions above, PRSS was making a contribution with respect to this goal.

2.4.2 *Committee of Visitors Process*

The COV process is an important opportunity for the science community to provide review and offer insights into the effectiveness and efficiency of PRSS. We strongly recommend

improving the process so that the review is more effective. Our recommended changes to the process address the need to trace the effectiveness of the COV process from review to review, to provide improved quantitative information to the committee prior to the visit, and for more feedback from the science community on PRSS performance.

In reviewing the previous COV report, we discovered a number of issues and recommendations that we raise again. To ensure continuity, the previous COV reports and PRSS responses need to be included in the materials distributed to the committee prior to the time the committee convenes. Presentations from PRSS should include a discussion of the responses to the previous COV recommendations.

To improve the ability of the COV to provide well founded comments and develop strong recommendations, the material provided to the committee via briefing books and presentations needs to be more specific. The briefing book must target the issue questions raised for the three years under review. The books provided to this committee were somewhat spotty. The absence of complete data for the three years under review made it difficult to identify trends. The absence of quantitative data such as numbers of projects reviewed, evaluated, and fielded made it impossible to complete a detailed evaluation of some issues. The briefing book should be distributed to the Committee far enough in advance of the meeting to ensure that any missing information is identified early. A conference call between the Committee members prior to the meeting to organize focus areas and identify specific issues might also facilitate the process. The OPP presentation to the Committee should be expanded to include input from the User Committee Group Chair's and the NSF polar science program managers. The User Committees are an effective path for the science community to provide input to PRSS, albeit through Raytheon. These committees have a good sense of how responsive PRSS is to the needs of the science community. The science program managers work closely with PRSS staff and should be able to provide the COV with feedback on issues related to logistics, anticipated infrastructure needs, and the impact of ongoing maintenance and construction on scientific productivity.

Major Recommendation 6 : *“Improve the Committee of Visitors Process”*

OPP and PRSS should explicitly review the previous COV report and provide a summary of the actions they have taken to implement the recommendations. Specific metrics of performance and detailed science support data should be provided to the incoming committee for the time period under review.

SPECIFIC QUESTIONS FOR THE PRSS COMMITTEE OF VISITORS**(prepared by NSF/OPP)**

Question 1: Have the processes used by PRSS to establish its priorities been effective in capturing the needs and priorities of the Antarctic research community?

Question 2: Has the balance between PRSS support of current research and investment in infrastructure improvements been appropriate given the overall policy and budget constraints?

Question 3: Has PRSS supported Antarctic research and associated educational activity, providing logistics, equipment, and infrastructure in an effective, efficient, and cost-effective manner?

Question 4: Has PRSS managing the mix of contractors and federal agency providers of logistics capabilities so as to meet the program's goals? Is the mix an appropriate one?

Question 5: Have PRSS responsibilities for tasking and oversight of contractor activities been effectively met and appropriately documented?

Question 6: Has PRSS established appropriate performance measures for the activities of its contractors and federal partners that provide logistics or other support to the USAP? How well have these performance goals or measures been met?

Question 7: Has PRSS planned and managed South Pole Station Construction effectively?

Question 8: Has PRSS managed USAP in an environmentally responsible manner?

Question 9: Has PRSS met the applicable NSF goals established pursuant to GPRA?