SEMIANNUAL REPORT TO THE CONGRESS

September, 2004

Office of the Inspector General

NATIONAL SCIENCE FOUNDATION

About
The National Science Foundation...

The National Science Foundation (NSF) is charged with supporting and strengthening all research disciplines, and providing leadership across the broad and expanding frontiers of scientific and engineering knowledge. It is governed by the National Science Board which sets agency policies and provides oversight of its activities.

NSF invests approximately $5 billion per year in almost 30,000 research and education projects in science and engineering, and is responsible for the establishment of an information base for science and engineering appropriate for development of national and international policy. Over time, other responsibilities have been added including fostering and supporting the development and use of computers and other scientific methods and technologies; providing Antarctic research, facilities and logistic support; and addressing issues of equal opportunity in science and engineering.

... And The Office of Inspector General

NSF's Office of Inspector General promotes economy, efficiency, and effectiveness in administering the Foundation's programs; detects and prevents fraud, waste, and abuse within NSF or by individuals that receive NSF funding; and identifies and helps to resolve cases of misconduct in science. The OIG was established in 1989, in compliance with the Inspector General Act of 1978, as amended. Because the Inspector General reports directly to the National Science Board and Congress, the Office is organizationally and operationally independent from the agency.

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From the Inspector General

This report highlights the activities of the National Science Foundation (NSF) Office of Inspector General (OIG) for the six-month period ending September 30, 2004. Our office issued 10 audit reports that contained $1,218,677 in questioned costs and made recommendations that would put $174,370 in NSF funds to better use. We closed 38 civil/criminal cases and 51 administrative cases, and our investigations produced $522,387 in recoveries. Three cases were referred to the Department of Justice and 15 administrative cases were forwarded to NSF management for action during this period. To minimize future occurrences of fraud, waste, and abuse, our staff also conducts outreach activities to educate NSF grantees about the responsibilities that go along with accepting Federal funds.

The FY 2005 Management Challenges letter, which identifies the most serious management and performance issues facing the agency, appears on page 49 of this report. Although most of our audits are by necessity *external*, i.e., directed toward ensuring the financial and administrative compliance of NSF grantees, we also conducted *internal* audits that focus on subjects directly related to the Challenges. During this period, we reviewed aspects of the Math and Science Partnership Program (p. 13), the cost of visiting IPAs (p. 14), and the United States Antarctic Program (p. 15). Over the years OIG audits have been instrumental in identifying many management challenges, including the administration of grantee cost sharing. In October, the National Science Board approved a new policy intended to eliminate all but statutory and voluntary cost sharing. We will carefully monitor the effect of this new policy.

Since its inception, the position of NSF Inspector General has been appointed by and reports to the National Science Board. This arrangement has served both NSF and the taxpayers well. It has fostered a productive working relationship between the Board and OIG, while at the same time allowing our office the independence from management needed to carry out its sensitive mission of preventing fraud, waste and abuse, and promoting economy, efficiency and effectiveness. We were, therefore, supportive when the Board reaffirmed the current IG appointment and reporting structure in its August 2004 letter to the Subcommittee on Government Efficiency and Financial Management.

Finally, our efforts during this period have resulted in many constructive recommendations to NSF. This is possible because of the strong support we have received from the Congress, the Board, and NSF management, as well as the dedication and solid work of OIG employees. I want to express my sincere appreciation to all, and I look forward to continued cooperation as we work together to improve the agency operations that allow NSF to make its notable accomplishments in science and technology.

Christine C. Boesz, Dr.P.H.
Inspector General
November 19, 2004

Executive Summary

- The OIG's FY 2005 list of the most serious management and performance challenges facing the National Science Foundation appears on p. 49.

- OIG conducted an audit of the Math and Science Partnership (MSP) Program to determine the effectiveness of its evaluation processes. The audit reviewed nine partnerships funded in FY 2002 and found that five had effective evaluation plans, but four were missing key evaluation elements although steps could be taken to address these issues. Further, although NSF indicated it planned to evaluate the overall MSP program, it had not yet formalized its plans for a program evaluation process or set definitive timeframes or deadlines. (See p. 13)

- At the Agency's request, OIG contracted with the Defense Contract Audit Agency (DCAA) to perform an incurred cost audit of NSF's Antarctic Support Services Contractor. In September 2004, DCAA staff reported on the interim results of the first phase of this audit. Of the $363 million total costs claimed by the Contractor for the three-year period ending December 31, 2002, the auditor questioned $29.2 million because the Contractor improperly billed indirect costs to the contract. (See p. 15)

- An audit of a foreign treaty organization that has received $16.4 million in NSF awards for global change research found that NSF, on behalf of the United States, is funding a disproportionate share of the organization's total costs. This occurred because 18 other member countries did not provide research contributions in the amounts originally anticipated. As a result, the foreign organization had average annual expenditures of only $2.6 million or 82 percent less than expected, thereby impeding its ability to achieve its research goals. The U.S. contribution, which was initially expected to comprise 25 percent of the organization's total funds, actually represented 87 percent of its income from 1996 to 2003. (See p. 17)

- The owner of a company that received Small Business Innovation Research (SBIR) awards from NSF and other Federal agencies pleaded guilty to mail fraud and tax evasion. The owner sent a progress report to NSF for his SBIR Phase II award that included research previously conducted by the company under an Air Force SBIR award. He also used Federal SBIR funds to pay for personal expenses, such as repairs and improvements to his home, thereby evading over $93,000 in income tax on his personal tax return for 1999. The total loss of Federal funds related to the subject's fraudulent scheme is estimated at $1.4 million. (See p. 25)

- After receiving an allegation that a postdoctoral scientist fabricated and falsified data in a published research paper, OIG concluded that the researcher knowingly and intentionally fabricated data in multiple analyses to make it appear that replicate experiments had been completed when in fact only a single analysis had been performed. The scientist's actions ultimately led to the retraction of the entire publication in which the fabricated and falsified data appeared. We recommended that NSF make a finding of research misconduct against the subject and debar him for two years. (See p. 28)

- OIG recommended that NSF debar a PI for two years for fabricating the existence of and citations for two manuscripts referenced in his two NSF awards. An investigation by the PI's university determined that he provided false biographical information as part of his NSF proposals. The PI cited two manuscripts as "submitted to" two prominent journals, and also referenced a "submitted" manuscript within the text of the proposal for his CAREER award. The manuscripts did not exist. The investigation also identified a pattern of misrepresentation by the PI that extended over a 10-month period. (See p. 29)

OIG Management Activities

2005 Management Challenges

In October 2004, the Office of Inspector General (OIG) submitted to agency management its list of what it considers to be the most serious management and performance challenges facing the National Science Foundation (NSF). The list was compiled based on our audit work, general knowledge of the agency's operations, and the evaluative reports of others, such as GAO and NSF's various advisory committees, contractors, and staff. The items on the list are unchanged from last year, mainly because they reflect areas of fundamental program risk that continue to pose obstacles to NSF's accomplishment of its mission. They will therefore require ongoing attention from NSF management over the long term. The OIG's management challenges letter appears in its entirety in the Appendix on page 49. Additional information about the status of some challenges appears elsewhere in this report and is referenced in parentheses. The 11 specific challenges include:

1. Workforce Planning and Training (p. 14)
2. Administrative Infrastructure
3. Management of Large Infrastructure Projects
4. Post-Award Administration
5. Cost Sharing
6. Information Security
7. GPRA Reporting
8. Cost Accounting
9. Management of U. S. Antarctic Program (p. 15, 20)
10. Broadening Participation in the Merit Review Process
11. Math and Science Partnership (p. 13)

Legal Review

Statutory and Regulatory Review

The Inspector General Act of 1978, as amended, mandates that our office monitor and review legislative and regulatory proposals for their impact on the OIG and NSF's programs and operations. We perform these tasks for the purpose of providing leadership in activities that are designed to promote economy, effectiveness, efficiency, and the prevention of fraud, waste, abuse and mismanagement. We also keep Congress and NSF management informed of problems and monitor legal issues that have a broad effect on the Inspector General community. During this reporting period, we reviewed seven bills that affected NSF, OIG, or both. The following legislation merits discussion in this section.

Program Fraud Civil Remedies Act of 1986 (PFCRA) (31 U.S.C. §§ 3801-3812)

A legislative priority that we support is amending PFCRA to include NSF and the 26 other Designated Federal Entity (DFE) agencies that are currently excluded from participation under the Act's enforcement provisions. The Office of Inspector General's concern related to PFCRA involves the ability of DFE agencies to fully implement their statutory mission to prevent fraud, waste and abuse by availing themselves of the enforcement capabilities contained within the Act. In fact, we have raised the issue of NSF's inclusion under the PFCRA legislation in several prior semi-annual reports.

PFCRA sets forth administrative procedures that address allegations of program fraud when the claims are less than $150,000. Currently, the executive departments, military departments, establishments, as defined under the Inspector General Act of 1978, and the United States Postal Service, are the only agencies permitted to act under PFCRA. NSF and other DFE agencies with Inspectors Generals appointed by agency heads are not included.

We believe that using the enforcement provisions of PFCRA will enhance NSF and other DFE agency recoveries in instances of fraud that fall below PFCRA's dollar threshold. In short, including NSF and other DFE agencies under PFCRA will further the OIG community's statutory mission to deter fraud, waste and abuse.

Earlier this year, the joint legislative committee of the President's Council on Integrity and Efficiency (PCIE) and the Executive Council on Integrity and Efficiency (ECIE) agreed to recommend to the entire OIG community that PFCRA be amended, as described above, and adopted as a OIG legislative priority. The NSF OIG has had a leading role in this effort.

Outreach

As part of our ongoing efforts to prevent and detect fraud, waste, and abuse, we reach out to the communities we serve to inform them about our work. Our customers include the national and international research communities, other Federal agencies and OIGs, and NSF.

Working with the Research Community

IG Co-hosts International Accountability Forum. The Inspector General co-hosted a workshop, *Accountability in Science Research Funding*, with Dr. William Harris, Director General of the Science Foundation Ireland, in Dublin Ireland on June 9 and 10, 2004. The purpose of the meetings was to present and discuss models of monitoring and auditing science and engineering projects and to share best practices among the participating organizations. Fourteen countries were represented at the workshop including officials from Austria, Belgium, China, Bulgaria, France, Germany, Switzerland, and United Kingdom. Presenters at the workshop included Dr. Boesz the Inspector General, Deborah Cureton the Associate Inspector General for Audit, and NSF's Chief Financial Officer Thomas Cooley.

Presenters offered case studies to explore factors that make accountability programs effective. Participants agreed that while international collaborations make complex and expensive projects more feasible, the accountability challenges are enormous both in terms of scope and resources required. Strong global communication and cooperation among accountability professionals are necessary to gain efficiency and to produce timely and effective reporting systems. The workshop participants expressed interest in continuing the dialogue and developing an auditor exchange program among countries to facilitate better understanding of each other's audit environment.

AIGI Delivers Keynote Speech. OIG was invited to the Australian Research Management Society (ARMS) in Fremantle, Western Australia, where Peggy Fischer, Associate IG for Investigations, was a keynote speaker discussing compliance programs. The session revealed both the differences

Effective compliance programs, as described by the Federal Sentencing Guidelines for Organizations, have seven characteristics:

1) Establish compliance standards and procedures to prevent and detect violations of law.

2) Have leadership and governing authority that is knowledgeable about the content and operation of the compliance program. Specific high-level individuals (with adequate resources and authority) should be assigned overall responsibility to ensure implementation and effectiveness of the program and should report directly to the governing body.

3) Use reasonable efforts not to include in its organization individuals with substantial authority whose conduct is inconsistent with an effective compliance program.

4) Communicate its compliance program to its employees, agents, leaders, and board.

5) Take steps to monitor and audit its systems to prevent and detect violations of law, evaluate its compliance program, and implement a whistleblower system that is free of retaliation.

6) Provide incentive to ensure conformance with the program and disciplinary steps for engaging in violations of law or for failing to take steps to prevent or detect those violations

7) Take steps to respond to violations of law and prevent future violations.

These seven factors have provided the framework for compliance programs effected as part of settlement agreements negotiated by the Department of Justice and other Federal agencies.

and similarities between the Australian and American approaches to funding research. The ARMS participants have a strong interest in developing commercial funding for academic research and were concerned about conflict-of-interests issues. ARMS members, as well as representatives from Denmark, Scotland and Great Britain, also expressed concerns about the tension between securing research funds and ensuring compliance. The conference again illustrated that scientific and research communities around the world face many of the same administrative problems and can greatly benefit from sharing their experiences and ideas.

OIG Staff Present at Conferences. OIG staff members were also invited to speak at a wide range of conferences held by institutions and associations, as their members explore ethical dilemmas that arise in conducting research and discuss ways to avoid research misconduct and the consequences of committing research misconduct. Presentations were given at the annual meeting of Federal Research Demonstration Partners; Murray State University in Murray, KY as part of Scholars Week; the National Center for Atmospheric Research in Bolder, CO; and Emory University's Values in Science course. The Society for Research Administrators International requested that we hold workshops at their meetings in Baton Rouge, LA and Portland, ME. Workshop attendees were interested in a number of subjects including conflicts of interests, the obligations and commitments of principal investigators, implementing compliance programs, cost-sharing documentation, and human subjects research.

A member of our staff participated in a panel discussion at the National Council of University Research Administrators (NCURA) 2004 Summer Conference in Providence, RI. The panel addressed issues related to developing effective compliance plans such as designating decision makers and providing proper training, and emphasized how a good compliance plan can provide mitigating factors in administrative, civil, and criminal proceedings. We also participated in NCURA's San Francisco meeting.
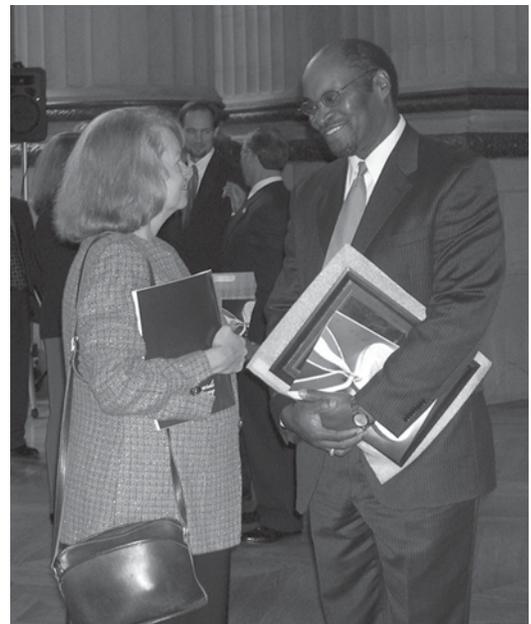
Working with the Federal Community

Workgroup Advises on Erroneous/Improper Payments. The Improper Payments Improvement Act of 2002 (P.L. 107-300) requires agencies to review all programs and activities annually and identify those that are susceptible to significant improper payments. Under the direction of the Office of Management and Budget (OMB), the Federal Workgroup on Erroneous/ Improper Payments is examining ways to address issues faced by grant-making agencies in implementing this Act. In particular, collecting data on improper payments from the awardee and subawardee has proven to be a challenge.

The workgroup is developing cost-effective approaches for identifying and reporting improper payments. For example, it is drafting a sampling methodology for grant programs. It is also examining Single Audit reports maintained by the Department of Commerce to evaluate how the reports could be used to identify and/or reduce improper payments. As the primary attendee from the OIG community, the NSF OIG representative provided a perspective on what actions the OIG community is planning to take on evaluating agency actions to comply with this Act.

Research Business Models Workgroup. During this reporting period, we attended the first meeting of the Research Business Models Working Group on Subrecipient Monitoring, sponsored by the National Science and Technology Council's Committee on Science. The group plans to evaluate current Federal guidance on subrecipient monitoring contained in OMB Circular A-133 and attempt to simplify or eliminate procedures for overseeing grant funds passed-through to other organizations that may be redundant. The meeting included representatives from OMB and from other research agencies such as the Office of Naval Research, the Department of Health and Human Services, and the Environmental Protection Agency. Because NSF relies on the A-133 audits to help monitor awardees' compliance with Federal requirements for subrecipient monitoring, we will participate in future meetings of the working group to keep abreast of proposed revisions to OMB guidance and to offer input from the audit perspective.

Dr. Boesz discusses peer reviews for investigative organizations with Don Hickman of the Tennesee Valley Authority.

ECIE Prepares for Investigative Peer Reviews. NSF OIG has played a leading role in an ECIE working

group that is preparing for upcoming investigative peer reviews. The working group hosted a training session developed by the Inspector General Academy to assist the ECIE OIGs in developing effective policies and procedures for these voluntary reviews. Our Office of Investigations will undergo peer review early in the upcoming semiannual period.

IG Counsels Discuss Electronic Signatures. As electronic submissions from applicants, grantees, and contractors become more commonplace, the matter of verifying who is actually submitting the electronic information to the agency has become an issue in some investigations and litigation. The Council of Counsels to Inspectors General has appointed a group to evaluate the issues associated with electronic signatures, and we participated in the opening meeting.

Misconduct in Research Working Group. In response to the Office of Science and Technology Policy's issuance four years ago of a common Federal definition and procedure for investigation of allegations of research misconduct, we continue to work with other Federal agencies and OIGs as they implement appropriate policies and procedures. Over half of the 23 agencies that conduct or fund research have drafted or established a policy on handling research misconduct allegations. Most of those policies articulate a role for IG offices ranging from providing assistance, to handling any civil or criminal matters related to the allegations, to the responsibility for investigation of the research misconduct allegations.

PCIE/ECIE Committees. NSF OIG continues to play an active role on the PCIE/ECIE Investigations Committee, which is overseeing the development of a peer review process, and on the Inspection and Evaluation Committee, which is revising its standards for inspections and developing a peer review process for inspection units. OIG staff also participated in updating the PCIE/ECIE Strategic Framework, which sets out the mission and goals of PCIE/ECIE over the next five years.

Working with NSF

Conflict-of-Interest Briefings. NSF's Designated Agency Ethics Official continues to offer OIG staff an opportunity to discuss the roles and responsibilities of our office at the conflict-of-interests briefings that occur approximately twice a month. We also continue to participate in the agency's Program Management Seminar, which provides new NSF staff with detailed information about the Foundation and its activities. Experienced OIG staff serve as resource personnel at this three-day training.

Audits *&* Reviews

Significant Reports

Evaluation of Math and Science Partnership Projects Can Be Improved

OIG conducted an audit of the Math and Science Partnership (MSP) Program to determine the effectiveness of its evaluation processes. The audit reviewed nine partnerships funded in FY 2002 and found that five had effective evaluation plans, but four were missing key evaluation elements although steps could be taken to address these issues. Further, we found that, although NSF indicated it planned to evaluate the overall MSP program, it had not yet formalized its plans for a program evaluation process or set definitive timeframes or deadlines.

In fiscal years 2002 and 2003, NSF awarded a total of $436.6 million for 35 comprehensive and targeted awards under its MSP program, many of which will extend over a five-year period. The legislation authorizing this program, which is intended to strengthen elementary and secondary mathematics and science education, requires evaluation processes and measures to assess the impact of intervention strategies and activities on student achievement. It also requires NSF to evaluate its overall MSP program.

To ensure that all MSP projects could report on the effect of their intervention strategies on student achievement, we recommended that NSF require that the basic evaluation elements identified in the audit report be included in all current and future MSP project evaluation plans. We also recommended that NSF

program officers verify that the basic evaluation elements are included in current projects' evaluation plans, and where needed, work with the projects to address elements that are missing or need improvement. Finally, we recommended that NSF develop and document a comprehensive management plan for evaluating the overall MSP program that includes definitive milestones and timeframes.

NSF agreed that appropriate overall guidance for evaluations should be included in program solicitations, but did not agree that a framework of required evaluation elements is necessary. However, NSF will convene a workshop of evaluators currently engaged in MSP work to prepare an evaluation statement of practice for current and future MSP projects. NSF also stated that planning for the overall MSP program evaluation has progressed and it has issued a contract for an evaluation of the overall MSP program. Further, NSF stated it has an information system under development that will collect common data elements to be analyzed.

Additional Costs of Visiting Personnel Identified

During this reporting period, we conducted an audit to identify any additional costs associated with NSF's use of temporary professionals appointed under the Intergovernmental Personnel Act (IPA) and NSF's Visiting Scientists, Engineers, and Educators (VSEE) program, instead of permanent staff. To stay in the forefront of scientific initiatives and innovation, NSF relies on the services of highly qualified scientists and engineers in a broad spectrum of fields. NSF refreshes and supplements its permanent professional staff by hiring temporary "rotators" from the nation's research and education institutions, organizations, and industry.

NSF incurs no additional costs for employing VSEEs rather than permanent employees. However, NSF's additional costs for employing IPAs were approximately $1.3 million annually, an average of $8,518 per IPA, and were largely for higher salaries and compensation for lost consulting fees. As of March 2004, NSF employed 147 IPAs and 39 VSEEs at an approximate annual cost of $23 million and $4.6 million respectively.

The audit also found that rotators were the primary users of NSF's Individual Research and Development (IR/D) program which allow employees and rotators time off and travel funding to conduct research, usually at their home institutions. When rotators' estimated travel costs for this program are included, additional costs for IPAs and VSEEs nearly doubled to approximately $2.4 million annually. Rotators accounted for approximately 75 percent of the active IR/Ds on file as of May 2004, and if

the estimates provided in the IR/D proposals are realized, NSF will annually contribute 5,238 staff days or the equivalent of 20 full-time positions and $1.3 million in travel costs to support IPA and VSEE independent research.

NSF complied with Office of Personnel Management and agency rules and regulations governing rotator assignments. However, we identified a few areas where NSF could further improve its administration of the IPA and VSEE programs. For example, we recommended that NSF develop a program to automate its IPA salary and benefit computation process, in order to improve the accuracy of these computations. We also recommended that NSF explore alternative methodologies for computing VSEEs' salaries to avoid duplicating payments in determining the salary amounts. NSF generally agreed with our recommendations.

Interim Audit Questions $29.2 Million in Costs Claimed by Antarctic Services Contractor

At the Agency's request, OIG contracted with the Defense Contract Audit Agency (DCAA) to perform an incurred cost audit of NSF's Antarctic Support Services Contractor. NSF finances and supports Antarctic research, relying on its Contractor to provide logistics and support services valued at approximately $1.172 billion over ten years, including the five-year award and five-year option. In September 2004, DCAA staff reported on the interim results of the first phase of this audit. Of the $363 million total costs claimed by Contractor for the three-year period ending December 31, 2002, the auditor questioned $29.2 million because the Contractor improperly billed indirect costs to the contract.

An aerial view of McMurdo Station Antarctica (photo by Thomas Cross)

The auditors questioned $21.1 million because the Contractor did not bill indirect costs in accordance with the terms of the contract and its own disclosed accounting practices. Specifically, the Contractor claimed indirect costs as direct costs of the contract, including $8.6 million related to home and corporate office costs, $5.7 million related to facilities costs, $3.4 million related to human resources costs, $2.7 million related to financial management costs, and over $700,000 related to sign-on bonus costs.

The auditors also questioned $6.7 million because the Contractor claimed overhead and General and Administrative (G&A) costs that exceeded the limitations specified in the contract agreement. DCAA found that the Contractor claimed $3.5 million and $3.2 million for overhead and G&A costs, respectively, in excess of the contract limits. The remaining $1.4 million was questioned because the fringe benefit costs claimed exceeded what was allowable.

We referred the audit report to NSF's Division of Contracts and Complex Agreements and recommended that NSF consider these findings in its review of the Contractor's claim for final payment. The remaining phases of the Antarctic Services Contract audit will include a review of the Contractor's internal controls for administering, monitoring, and accounting for the NSF contract funds and a review of the direct costs and remaining indirect costs charged to the contract through December 31, 2004.

NSF Awards for International Programs

International research partnerships bring together counties and scientists with a wide range of backgrounds, information, expertise and resources in the hope of fostering creative solutions to important global research problems. NSF estimates that five to ten percent of its annual budget (between $240 and $480 million in fiscal year 2003) is invested in activities with significant international scope. The vast majority of these funds go to U. S. institutions to support international activities and collaboration, but approximately $60 million was awarded directly to 24 foreign institutions during fiscal years 1998-2002. As collaborative international research efforts increase in number, significance and complexity, the challenge for NSF is to develop an effective approach for managing its international activities.

Notwithstanding the many benefits of international research programs, NSF awards made directly to foreign institutions may be at increased risk for financial problems and lack of compliance with award requirements. Foreign organizations are less likely to understand U.S. grant requirements and are accustomed to different accounting practices and standards in their countries. Furthermore, NSF processes that are typically applied to awarding and administering domestic grants may not be appropriate for the unique nature of most foreign funding arrangements.

In FY 2003 we identified four foreign organizations for audit that received $46 million or 76 percent of total award funding provided directly to foreign institutions during fiscal years 1998-2002. We are reporting on the second of these audits below and are continuing work on the two remaining foreign organizations.

NSF Disproportionately Funds Foreign Treaty Organization

In September, we issued an audit of a foreign treaty organization that since 1996 has received $16.4 million in NSF awards for global change research. We found that NSF, on behalf of the United States, is funding a disproportionate share of the organization's total costs. Although the U.S. contribution was initially expected to comprise 25 percent of the organization's total funds, it actually represented 87 percent of its income from 1996 to 2003. This occurred because 18 other member countries did not provide research contributions in the amounts originally anticipated. As a result, the foreign organization had average annual expenditures of only $2.6 million or 82 percent less than expected, thereby impeding its ability to achieve its research goals.

Additionally, the foreign organization needs to improve financial management and oversight of its 14 research network subawards, valued at $10.3 million. The organization did not perform either pre-award assessments of the subrecipients' capability to administer NSF grant funds or post-award monitoring to ensure grant funds were spent in accordance with its subaward agreements. Consequently, the organization encountered serious problems with two subrecipients that could not adequately support their claimed costs on awards totaling $1.1 million.

Funding for the organization did not materialize as expected because the foreign organization's treaty agreement required member countries to provide only *voluntary* contributions to support its operational costs and research programs. We found that the organization did not give adequate priority or attention to seeking alternate sources of funding when the shortfalls occurred. Similarly, the organization did not give sufficient priority to monitoring and improving its oversight of subawardees because it did not understand its responsibilities for NSF grants. NSF efforts to effect procedural changes in the grantee's managing and monitoring of award funds were difficult and not always successful because the changes had to be approved & implemented by the organization's governing body, which included representatives from all 19 member countries.

Given the lack of financial support by other member countries, we recommended that NSF work with the governing body to promote and oversee fundraising activities; re-assess the organization's mission, goals, and staffing levels if additional funding is not obtained; and ensure that the organization establishes written subaward management policies and procedures. Finally, we recommended that NSF cease providing additional research awards to the organization until it has developed and implemented written monitoring procedures to ensure its subawardees are properly accounting for and managing NSF grant funds.

NSF generally concurred with the audit conclusions and recommendations. NSF agreed to continue working with the organization's governing body to direct the foreign organization to give priority to fund-raising activities and to re-evaluate its programs if additional funding is not obtained. Also, the foreign awardee stated that subaward management policies and procedures were being developed and NSF agreed to provide technical assistance in this regard.

Awards to Community Colleges

Community colleges historically have received approximately $30 to $40 million in annual NSF funding. Prior audits of community colleges have identified questioned costs and grant accounting control weaknesses, mostly related to cost sharing, subawardee monitoring, and labor activity reporting. To assess the extent of these problems, we initiated audits over the past three years at 14 community colleges that had received 78 NSF awards totaling about $46 million. In two prior Semiannual Reports[1], we reported on the results of eight community college audits. Since that time, we have completed an additional three audits, including the one described in the following section.

Northwestern Community College Unable to Document or Track NSF Funds

OIG completed an audit of awards to a Northwestern community college for an environmental technology-training center and for improving math and science curriculum programs in rural communities. We were unable to determine whether $1.1 million of costs claimed by the community college were spent on those projects so we could not express an opinion on the claimed costs or cost sharing. Consequently, we questioned all of the $1.1 million of direct costs funded by NSF and the entire $35,000 of cost sharing required on two expired awards. We also identified another $141,000 of cost sharing on a third award that was still active at the time of our audit as being "at-risk" that the contributions would not be made.

The community college lacked an adequate financial management system for recording the receipt and expenditure of funds for projects supported by NSF, and did not have source documentation to support the costs charged to the NSF projects. We identified these as material

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[1] September 2002 Semiannual Report (pp.24-26);
September 2003 Semiannual Report (pp.22-23)

deficiencies in the community college's internal controls for administering NSF awards. Given the pervasiveness of the financial management deficiencies disclosed, we recommended that NSF identify this community college as a high-risk grantee under its risk management program. Until the community college implements corrective actions, NSF has little or no assurance that the community college will spend NSF award funds on authorized purposes or that the overall project goals will be achieved as originally anticipated. The community college acknowledged the problems identified in the audit report, and stated that since the audit was completed it had taken a number of actions to improve its internal controls. We referred the audit report to NSF's Division of Institution and Award Support for resolution.

Audits of Indirect Cost Rates

Approximately 20 percent of the $5 billion of costs incurred annually by NSF grantees, or $1 billion, are for indirect costs. Because of the significance of this type of expense and the risk of inflated indirect cost rates, we have undertaken audits of a sample of twelve indirect cost proposals. During this reporting period, we completed our tenth audit.

Scientific Society Needs to Improve Its Federal Award Administration and Indirect Cost Rate Proposal Preparation

OIG reviewed the FY 2000 and FY 2001 indirect cost proposals of a scientific society with offices in Washington, D.C. and the Midwest. Based on Federal cost principles, the awardee improperly included $178,075 of unsupported travel costs in its indirect cost pools. The awardee also incorrectly excluded $4.8 million of costs from the direct cost bases. These errors resulted in the awardee overstating its proposed indirect cost rates by 1.9 percent and 1.68 percent for fiscal years 2000 and 2001, respectively. In addition, we found that the organization did not account for all employees' activities as required by Federal cost principles to ensure that actual labor costs would be fairly charged to Federal awards.

We recommended that NSF require the organization to develop and implement written policies and procedures that covers the inclusion of all activities in the direct cost base and the retention of adequate supporting documentation for all travel costs. Further, we recommended the organization not charge direct labor or allocate indirect labor charges to any Federal awards until it maintains supporting documentation for labor charges that meets the requirements in the Federal cost principles. The organization agreed with our recommendations but stated that it should be allowed to charge labor as

cost sharing on Federal awards without accounting for labor as prescribed by Federal cost principles. We disagree and have referred the issue to NSF's designated audit resolution official for a decision.

Corrective Actions Prompted by Previous Audits

Recommendation Addressing Antarctic Infrastructure Planning Remains Unresolved

Our March 2003 Semiannual Report described an audit of the U.S. Antarctic Program's Medical and Occupational Health and Safety Programs for which we recommended that NSF initiate life-cycle planning and associate budget resources with its planned upgrades and replacements for USAP facilities.[2] This recommendation remains unresolved. Because we have been unable to reach resolution with NSF management on this recommendation, we are referring the matter to NSF's designated audit resolution official, the NSF Deputy Director, for a decision. The audit report is posted on the OIG website, http://www.oig.nsf.gov/auditpubs.html.

Large Western University System Changes Policy Allowing Excess Faculty Compensation

A western university system, that has received $280 million in NSF funding over the last ten years, had allowed faculty to be paid up to 25 percent above their full-time academic year salary from Federal funds without prior Federal approval. However, as a result of an audit reported in our March Semiannual Report[3], the university system changed its long standing position and agreed to instruct all of its campuses to clearly identify and obtain prior written NSF approval for overload compensation, or for any extra salary for faculty members during the academic year.

The specific campus we audited revised its grant policies in August 2004 to eliminate the provisions that previously allowed overload compensation. NSF officials agreed that the change in policy could result in an estimated $800,000 of NSF grant funds that can be used for other program purposes over the next five years.

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[2] March 2003 Semiannual Report, p.19
[3] March 2004 Semiannual Report, p.16

Three Indirect Cost Rate Audits Resolved

During this reporting period, NSF resolved indirect cost rate audits previously reported in our September 2003 Semiannual Report[4]:

For a natural history museum, NSF agreed that the five percentage point reduction from the museum's proposed indirect cost rate of 55.34 percent to our audited rate of 50.02 percent would generate a projected $594,954 savings to the Federal Government over five years. NSF also sustained $46,326 of questionable costs that the museum charged to NSF grants. NSF will work with this organization to finalize rates from past years. However, since NSF is no longer cognizant for this organization, future rate proposals and the methodology on which they are based will be worked out with the cognizant agency.

For a Midwestern botanical garden, NSF agreed to assess how to treat $2 million of curatorial costs. If curatorial costs are excluded from its indirect cost pool, the institution's proposed indirect cost rate would drop by as much as 46 percent. The institution agreed to make the necessary changes to its accounting system to improve its general ledger accounting for indirect costs and develop a time keeping system to document its staff work on Federal projects.

For a Midatlantic research institution, we found that the organization misclassified $2 million of research stipends, which were de facto salary and wages, thereby overstating its five separate indirect cost rates by as much as 39 percent. The institution disagreed claiming that stipends are participant support, which is not used in the calculation of indirect cost rates. NSF agreed to discuss research stipends further with the organization and determine how such costs should be classified in calculating the institution's indirect cost rates.

Work In Progress

Grantee Reporting

We are currently conducting an audit of the timeliness of required annual and final reports from NSF award recipients. NSF collects a significant amount of information on the progress and results of the awards it funds through these reports. When a report submission is not timely, it can impact the program

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[4] September 2003 Semiannual Report, p.21

officer's ability to effectively manage the award. Furthermore, missing reports could impact NSF's ability to report to stakeholders such as the National Science Board and Congress on the contributions of funded research to science and engineering. This audit examines both the timeliness and use of annual and final project reports. We will issue our audit report during the next semiannual reporting period.

Survey of a Science and Technology Center

Because of their size and complexity, awards to Science and Technology Centers (STCs) contain more financial risk than most other NSF awards. NSF's Office of Integrative Activities requested that the OIG conduct audits of several STCs that had recently undergone significant changes in leadership and management. During this reporting period, we conducted a survey of an STC to learn more about the STC program and observe Center operations. Our survey identified several strengths in the Center's leadership and management, as well as opportunities to improve its internal controls in the areas of monitoring sub-recipients and documenting policies and procedures.

We will use the results of this survey to conduct a performance audit of two other STCs. The objective will be to assess whether each Center's management control environment supports the accomplishment of its goals and research mission. In conjunction with this performance audit, we are contracting with an independent public accounting firm to determine if the Centers have adequate financial management controls to safeguard NSF funds, properly account for payments and expenditures, and comply with award requirements, including any cost sharing. We expect to issue reports on each of these centers in the next semiannual reporting period.

Travel Cards

We recently initiated a follow-up audit of NSF's Travel Charge Card Program. The Travel and Transportation Reform Act of 1998 requires Federal employees to use a government credit card to pay for official government travel expenses such as hotels, transportation costs, and meals. This audit will examine whether cardholders are using their government travel cards properly and paying their bills in a timely manner. In addition, we will determine if NSF is adequately managing its travel card accounts. We expect to issue the audit report in the upcoming semiannual reporting period.

A-133 Audit Reports

The Single Audit Act of 1984 (Public Law 98-502), as amended, established uniform requirements for audits of non-Federal entities receiving Federal awards. Under the Act, non-Federal entities that expend $500,000 or more a year in Federal funds are required to have an organization-wide audit (referred to as an A-133 or Single Audit) of its financial statements and compliance with Federal award requirements.

Desk Reviews

In this reporting period, we conducted desk reviews of 88 A-133 audit reports with NSF expenditures totaling $1.1 billion between FYs 2001 and 2003. Of those reviewed, 71 reports contained reportable conditions and non-compliance findings. The most common deficiencies related to non-compliance with Federal cost principles, sub-recipient monitoring, and lack of source documentation. Questioned costs included $415,500 of NSF grants embezzled by a university employee and $170,199 in matching funds for which an entity was unable to provide adequate supporting documentation. In total, auditors questioned $1,224,286 of NSF award costs claimed by award recipients.

Our office also continued to examine Management Letters accompanying A-133 audit reports, which report less significant internal control weaknesses that still require attention by the institution's management. Our examination of Management Letters in this reporting period identified six entities with internal control problems in the areas of financial management, sub-recipient monitoring, and reporting. While considered less significant at the time of the audit, we have found that internal control weaknesses that are not addressed may become more serious over time.

In June, OIG recognized staff member Shirley Ross who received a degree in computer information systems.

Single Audit Quality Project

A-133 audit reports are essential to helping NSF fulfill its responsibility for monitoring the approximately $5 billion of awards it funds annually. However, concerns raised by Quality Control Reviews (QCRs) conducted by a number of Federal agencies have prompted the OIG community to conduct a

government-wide project to assess and provide a baseline measurement of Single Audit quality. Beginning in October 2004, the project will perform QCRs of a statistically representative sample of A-133 audits. Serving on both the Project Advisory Board and the Project Management Staff, the NSF OIG actively participated in 1) developing the sampling methodology and the evaluation instrument that will be used in the reviews, 2) drafting the Request for Proposals, and 3) selecting independent public accountants to conduct the reviews. Given the importance of A-133 audit quality to NSF's post-award administration, the OIG will continue to be involved in overseeing, conducting and reporting on the results of the QCRs.

Investigations

Civil and Criminal Investigations

Small Business Owner Pleads Guilty to Mail Fraud and Tax Evasion

An investigation of the owner of a company that received Small Business Innovation Research (SBIR) awards from NSF and other Federal agencies resulted in the owner entering a plea of guilty in Federal court. The investigation, which was conducted by NSF OIG and other affected agencies' OIGs, uncovered a broad scheme by the owner to defraud the government by submitting false statements in SBIR proposals and research reports, and converting award funds to his personal use.

The owner pled guilty to mail fraud, 18 U.S.C. § 1341, for sending a progress report to NSF for his SBIR Phase II award that included research that was previously conducted by the company under an Air Force SBIR award. He also pled guilty to tax evasion, 26 U.S.C. § 7201, for using Federal SBIR funds to pay for personal expenses, such as repairs and improvements to his home, thereby evading over $93,000 in income tax on his personal tax return for 1999. The total loss of Federal funds related to the subject's fraudulent scheme is estimated at $1.4 million.

Based on the guilty plea and our recommendation, NSF recovered $120,000 of its funds that it withheld from the NSF grant pending the outcome of OIG's investigation. We also recommended that NSF exclude the owner and his company from receiving funds from any Federal agency. NSF's decision is pending.

HIGHLIGHTS

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University Admits to Mis-Charging Technical Salaries to NSF Awards

OIG received a complaint that a university was charging a 5% surcharge to NSF awards for technical support salaries. We initiated an investigation and worked with the university to review technical support charges to NSF awards. Although we found no evidence of fraud, the university restored $364,539 to NSF for technical support expenses that were erroneously charged to its NSF awards. Generally technical support costs can be charged to Federal grants as direct costs only for particular services provided for particular grants; otherwise such costs constitute administrative support services costs that are included in the university's indirect cost rate.

As a result of our investigation, the university changed its policies and procedures to ensure that technical support is charged appropriately to Federal awards. The university also identified $518,993 of technical support charges that had been wrongfully charged to awards from 12 other Federal agencies. We notified the other Federal agencies of this issue and obtained a commitment from the university to work with each of them to resolve these overcharges.

University Employee Sentenced for Theft of Grant Funds

Attorney Richard Woodford addresses a grant fraud conference hosted by NSF OIG.

Last March we reported that a California university discovered that one of its employees had stolen $40,889 in NSF grant funds.[5] The subject pled guilty to one count of violating 18 U.S.C. § 666, "theft or bribery concerning programs receiving Federal funds," and was sentenced to 30 days in prison followed by 150 days of home confinement and 3 years of supervised release. We recommended that NSF debar the subject from obtaining the benefits of Federal awards for a period of two years. NSF has not yet acted on this recommendation.

[5] March 2004 Semiannual Report, p.26

Personal Use of Agency Information Technology Resources Clarified

Two recent Semiannual Reports described a case involving an NSF employee who advertised stolen property for sale using NSF's electronic bulletin board.[6] The employee did not cooperate with our investigation and ultimately resigned. During the course of this investigation, we identified several weaknesses in NSF's policy for personal use of information technology (IT) resources, and later issued a report with recommendations for corrective actions. In response, NSF recently updated the policy, defining acceptable personal uses of NSF's IT resources and prohibiting private business use. The revised policy provides that personal use of agency IT resources must not result in additional charge to the government, be offensive to others, or break the law. The revised policy also includes links to other relevant policies such as NSF's IT Security Policy for employees to review.

Administrative Investigations

Action by the Deputy Director

NSF Takes Action in Plagiarism Case

Last September, we reported on our investigation of an allegation that a proposal submitted to NSF that allegedly contained more than a page of text and associated ideas plagiarized from a confidential research proposal submitted to another agency.[7] We referred the matter to the subject's university, which conducted an investigation and concluded that the acts of plagiarism constituted reckless disregard of the standards of scholarship. We recommended that NSF make a finding of research misconduct, debar the subject from Federal funding for one year, and require certifications and assurances for a period of two years. NSF made a finding of research misconduct and debarred the subject from receiving Federal funds for a period of one year. In addition, NSF imposed a requirement that certification and assurance letters accompany the subject's proposals to NSF for the year following the debarment period, stating that the proposal complies with NSF's research misconduct regulation. Finally, NSF excluded the subject from participating as an NSF panelist, reviewer, advisor or consultant for a period of two years.

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[6] September 2003 Semiannual Report, p.31; March 2004 Semiannual Report, p.27
[7] September 2003 Semiannual Report, p.35

Plagiarism Results in Misconduct Finding Against PI

Last March, we discussed a case in which the subject plagiarized from a published paper and an NSF proposal received through the confidential peer review process.[8] Based on our investigation report and recommendations, NSF made a finding of research misconduct and required that any proposal submitted by the subject be accompanied by certifications by the subject and his department chair that his proposal contains no plagiarized material. The subject requested and has been granted an extension of time to file an appeal to NSF's Director.

Reports Forwarded to the Deputy Director

Post-Doctoral Researcher Fabricates Data

OIG received an allegation that a postdoctoral scientist working at a research institute affiliated with a major university in New York, fabricated and falsified data in a published research paper. The scientist's research, supported by NSF and the Public Health Service (PHS), was part of a larger collaborative project involving several universities located across the country, supported jointly by several Federal agencies. After reviewing the institute's inquiry and investigation reports, we determined that the institute had not followed its own published procedures for the investigation of allegations of research misconduct and decided to conduct our own investigation.

We concluded that the researcher knowingly and intentionally fabricated data in multiple analyses to make it appear that replicate experiments had been completed when in fact only a single analysis had been performed. The fabrication involved multiplying the values contained in the original data by a common factor to provide a new set of numerical values that were then presented as the replicate data set. To support the data fabrication, the researcher manipulated corresponding graphical images to make the image consistent with a falsified replicate analysis. The scientist's actions ultimately led to the retraction of the entire publication in which the fabricated and falsified data appeared.

We recommended that NSF make a finding of research misconduct against the subject and debar him for two years. Their decision is pending. We worked closely with the Office of Research Integrity of PHS to coordinate the joint final recommendation to both agencies.

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[8] March 2004 Semiannual Report p. 28

PI Fabricates Publication Record

OIG recommended that NSF debar a PI for two years for fabricating the existence of and citations for two manuscripts referenced in his two NSF awards, one of which was a CAREER award. An investigation by the PI's university determined that he provided false biographical information as part of his NSF proposals. The PI cited two manuscripts as "submitted to" two prominent journals, and also referenced a "submitted" manuscript within the text of the proposal for his CAREER award. The investigation determined not only that the manuscripts had not been submitted to the journals, but that the manuscripts did not exist at all.

The investigation identified a pattern of misrepresentation by the PI. In five proposals submitted to other agencies over a 10-month period, he claimed that the same two non-existent manuscripts were submitted to the same two journals. He later claimed that he planned to submit manuscripts to those journals shortly afterward, but neither manuscript existed when he submitted the first proposal, neither existed 10 months later when he cited them in the fifth proposal, and neither existed when we completed our investigation. The PI's pattern of misrepresentation also included an earlier misconduct case in which the PI was found to have committed plagiarism and falsification under a Public Health Service award when he was a postdoctoral fellow. The investigation also determined that the PI incorporated the same material involved in that case into another of his non-NSF proposals while he was a faculty member at the university.

As a result of its investigation, the University found that the PI committed research misconduct under its policy. He resigned from the faculty, thereby limiting the university's ability to take action. The PI had already begun work in a new position at a Federal research facility by the time he received a copy of our draft investigation report for comments; after receiving the draft, he resigned. To protect the Federal interest, we recommended that NSF debar the PI for two years, and that certifications and assurances be required for any proposals he might submit for a period of three years following his debarment. Their decision is pending.

Researcher Commits Plagiarism

We received an allegation that a PI at a California university copied material from multiple published papers into a proposal she submitted to NSF. In response to our questions about the copied text, the PI denied writing the proposal, explaining that she was merely a sponsor for the author, a researcher in her laboratory. Because the researcher was not eligible to be a PI under

the university's rules, the PI submitted the researcher's proposal under her name.

Following its investigation, the university concluded that the researcher committed research misconduct, specifically plagiarism, and that the PI was negligent in carrying out her responsibilities. Additionally, the investigation discovered several significant inaccuracies in the proposal. The university reprimanded the PI and the researcher, and took additional steps to ensure that the researcher does not work for the university in any research capacity or claim any association with the university for a period of two years.

We agreed with the university's conclusions, and recommended that NSF send a letter of reprimand to the researcher informing him he has committed research misconduct. We recommended that NSF require him to provide certifications that his submissions to NSF are properly referenced and accurate, for three years from the resolution of this case. Their decision is pending.

Co-PI Participates in Plagiarism of REU Proposal

We received an allegation that a Research Experiences for Undergraduates (REU) proposal submitted by a PI and co-PI at a Michigan university was plagiarized from a successful REU proposal written by scientists at another institution. We compared the two proposals and found roughly six and a half pages of identical or substantially similar text. The PI and co-PI told us they obtained a paper copy of the source proposal from the authors, made an electronic copy, and used this as the basis for their proposal. They explained that they intended to delete all the original text, but inadvertently neglected to do so.

As a result of its investigation, the university found that the co-PI committed research misconduct under its policy. The PI's case is not yet resolved. The university reprimanded the co-PI, and, for a period of two years: 1) required that an institutional official certify to the accuracy of reports under any of his Federal awards and provide assurance of compliance with all relevant institutional policies, regulations, and guidelines; 2) required that two institutional officials review his requests for Federal funding prior to submission; and 3) prohibited him from serving as an NSF reviewer. Consistent with the university's actions, we recommended that NSF find that the co-PI committed research misconduct, send him a letter of reprimand, require assurances of compliance for two years, and prohibit him from serving as an NSF reviewer for two years. We also recommended that he be required to complete ethics training.

Other Administrative Activities Resulting from Investigations

Court Enforces IG Subpoena

OIG went to court to compel a state entity to comply with an Inspector General subpoena; this is the first time we have been forced to seek judicial enforcement of a subpoena. To facilitate investigations and audits, the Inspector General Act provides broad authority to IGs to:

> require by subpoena the production of all information, documents, reports, answers, records, accounts, papers, and other data and documentary evidence necessary in the performance of the functions assigned by this Act, which subpoena, in the case of contumacy or refusal to obey, shall be enforceable by order of any appropriate United States district court . . .. (IG Act § 6(a)(4).)

In conjunction with an ongoing investigation, we issued an administrative subpoena to the Illinois Department of Revenue (IDR) for tax records and supporting documentation filed on behalf of two corporations under investigation. The IDR refused to comply, asserting that state law prevented them from disclosing state tax records.

The Federal subpoena authority under the IG Act preempts conflicting state law. The U.S. Attorney's Office for the Central District of Illinois filed a motion for enforcement of our subpoena in the U.S. District Court, which the IDR opposed. The Court agreed that the state law was preempted by the IG Act and ordered the IDR to comply with the subpoena, which it did.

$68,826 in Program Income Recovered

In past investigations and reports, we noted that grantees sometimes use program income incorrectly. Last September,[9] we discussed a proactive review we conducted to analyze the use of program income in conference and workshop awards. We selected a stratified random sample of awards from fiscal year 2001 and requested financial information about the award from the awardee institution.

Of the awards in the sample, 25 percent were initially determined to contain no program income issues. The remaining grants raised concerns that fell

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[9] September 2003 Semiannual Report, p. 41

Program Income

NSF grants for conferences and workshops are governed by either the Grant General Conditions (GC-1) or the Federal Demonstration Partnership (FDP) General Terms and Conditions, and, if mentioned in the award letter, by Grant Special Conditions FL 26, "Administration of NSF Conference or Group Travel Award."

Both the current GC-1 and FDP General Terms and Conditions mirror OMB Circular A-110's definition of program income:

"Program income means gross income earned by the recipient that is directly generated by a supported activity or earned as a result of the award. Program income includes, but is not limited to, income from fees for services performed, the use or rental of real or personal property acquired under Federally-funded projects, the sale of commodities or items fabricated under an award, license fees and royalties on patents and copyrights, and interest on loans made with award funds. Interest earned on advances of Federal funds is not program income. Except as otherwise provided in Federal awarding agency regulations or the terms and conditions of the award, program income does not include the receipt of principal on loans, rebates, credits, discounts, etc., or interest earned on any of them."

FL 26 states that:

"Any registration or other fees paid by conference participants shall be used to defray reasonable expenses directly associated with the conference for which funds are not otherwise available. If fees exceed such expenses, the remainder shall be used to offset allowable costs otherwise chargeable to this grant."

into four categories: failure to account for or properly use program income; inappropriate charges to the award; misuse of travel expenses; and reallocation of participant support without NSF permission. As a result of the review, we have thus far 1) recovered $68,826 that the awardees determined was inappropriately used, and 2) referred four matters to the Office of Audit. We also clarified the rules for handling conference award funds and associated program income with the awardees and program officers involved. We continue to work with the institutions to address the issues. During the coming semiannual period we expect to complete the project and prepare a Management Implications Report containing specific recommendations for NSF.

NSF Clarifies Its Policy on Holiday Pay

In spring 2003, OIG received several inquiries from employees regarding whether NSF was complying with the rules governing pay to employees required to work on holidays. They expressed concern about whether holiday pay was available for such work and whether supervisors would view their request negatively. We researched the applicable law governing holiday pay and compared it to NSF policy, procedure, and practice. Over the course of a year, we consulted with NSF's Office of General Counsel and Division of Human Resource Management regarding our findings. During this period, NSF clarified its policy concerning holiday pay by issuing an agency bulletin summarizing applicable law, providing examples of the circumstances under which employees are entitled to holiday pay, and encouraging NSF Directorates and Offices to consult with the Division of Human Resource Management regarding employee entitlement to holiday pay prior to the anticipated holiday work.

NSF Takes Steps To Improve Monitoring Of Human Subjects Research

Past OIG investigations identified shortcomings with NSF's procedures to monitor and enforce

compliance with the Federal regulation for the protection of human subjects, known as the Common Rule. Under the Common Rule, an institution must have received approval from its institutional review board (IRB), or affirmatively declare an exemption from the government-wide regulation, before NSF may grant the award for a project involving human subjects. NSF currently relies on grant applicants to self-identify the involvement of human subjects in proposals; however, OIG investigations have drawn attention to the failure of applicants to do so. In our March 2004 Semiannual Report, we reported that a division within an NSF directorate failed to code NSF's internal forms, which are intended as a check on the self-reporting system[10]. The omission compromised NSF's ability to track the involvement of human subjects in NSF-funded projects in that directorate. When we reported these concerns to NSF, the agency changed the Grant Proposal Guide to present the requirements more clearly and emphasized the need for someone other than the PI to declare the relevant exemptions. The directorate involved also took steps to improve its internal review of human subjects compliance, including requiring program officers to specifically confirm human subjects compliance before an award can be made.

Federal regulations aim to protect the health and safety of human and animal research subjects such as "Pringles", a potbelly pig.

Eight Travel Card Cases Receive Administrative Actions

In our March 2004 Semiannual Report, we reported an investigation concerning misuse of government travel cards[11]. In one case, involving the falsification of official records to hide her misuse, the employee resigned her NSF position and pled guilty to violation of 18 U.S.C. § 2071(b), the willful and unlawful destruction of an official record, which is a felony. In eight less serious cases, NSF employees had misused their government travel credit cards by making ATM cash withdrawals and purchases that were unrelated to official travel. As a result of that investigation, NSF management imposed a range of administrative actions that varied with the seriousness of the violations. While most were issued reprimands or warnings, the most senior employee involved was issued a 5-day suspension and the travel cards of two employees were either revoked or suspended. Our office continues to work with NSF management to prevent and detect credit card fraud and abuse.

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[10] March 2004 Semiannual Report, pp. 28-30
[11] March 2004 Semiannual Report, pp. 23-24

Statistical Data

Reporting Terms Defined

Some of the more common terms that we use in reporting audit statistics and findings are defined below:

Questioned Cost. Auditors question costs because of an alleged violation of a provision of a law, regulation, grant, cooperative agreement, or contract. In addition, a questioned cost may be a finding in which, at the time of the audit, either a cost is not supported by adequate documentation, or the expenditure of funds for the intended purpose is deemed unnecessary or unreasonable.

Unsupported Cost. A cost that is questioned because it is not supported by adequate documentation at the time of audit.

Unresolved Costs. Costs that have been claimed, but can not be evaluated at the time of the audit because either: 1) the criteria for their measurement has not been established; 2) the period for establishing the criteria is not complete or 3) the criteria is unclear or ambiguous. This category most frequently applies to indirect costs. For example, if a final indirect cost rate has not been determined for a particular period, the claimed indirect costs for that period would be classified by the auditor as unresolved costs.

Management Decision. Management's evaluation of the findings and recommendations included in the audit report and the issuance of a final decision by management containing its response to such findings and recommendations. It is important to note that NSF is responsible for making a management decision regarding questioned costs that determines whether they will be sustained (i.e., disallowed) or allowed.

Funds Put to Better Use. Audit recommendations that identify ways to improve the efficiency of programs frequently lead to prospective benefits over the life of an award or funds put to better use. Examples include reducing outlays, deobligating funds, or avoiding unnecessary expenditures.

Final Action. The completion of all management actions that are described in a management decision with respect to audit findings and recommendations. If management concluded that no actions were necessary, final action occurs when a management decision is issued.

Compliance or Internal Control Issues. Audits often result in recommendations either to improve the auditee's compliance with NSF and federal regulations, or to strengthen the auditee's internal control structure to safeguard federal funds from fraud, waste, abuse, and mismanagement.

Audit Reports Issued with Recommendations for Better Use of Funds

	Dollar Value
A. For which no management decision has been made by the commencement of the reporting period	**$11,738,793**
B. Recommendations that were issued during the reporting period	**$174,370**
C. Adjustments related to prior recommendations	**0**
Subtotal of A+B+C	**$11,913,163**
D. For which a management decision was made during the reporting period	**$6,738,793**
i) Dollar value of management decisions that were consistent with OIG recommendations	**$2,070,730**
ii) Dollar value of recommendations that were not agreed to by management	**$4,668,063**
E. For which no management decision had been made by the end of the reporting period	**$5,174,370**
For which no management decision was made within 6 months of issuance	**$5,000,000**

Audit Reports Issued with Questioned Costs

	Number of Reports	Questioned Costs	Unsupported Costs
A. For which no management decision has been made by the commencement of the reporting period	10	$628,670	$117,300
B. That were issued during the reporting period	22	$2,442,963	$1,176,884
C. Adjustment related to prior recommendations	2	$550,186	$0
Subtotal of A+B+C	34	$3,621,819	$1,294,184
D. For which a management decision was made during the reporting period	12	$1,035,632	$118,244
i) dollar value of disallowed costs	N/A	$180,085	N/A
ii) dollar value of costs not disallowed	N/A	$855,547	N/A
E. For which no management decision had been made by the end of the reporting period	21	$2,586,187	$1,175,940
For which no management decision was made within 6 months of issuance	1	$202,168	$0

Audit Reports Involving Cost-Sharing Shortfalls

	Number of Reports	Cost-Sharing Promised	At Risk of Cost Sharing Shortfall (Ongoing Project)	Actual Cost Sharing Shortfalls (Completed Project)
A. Reports with monetary findings for which no management decision has been made by the beginning of the reporting period:	0	$0	$0	$0
B. Reports with monetary findings that were issued during the reporting period:	1	$0	$141,114	$0
C. Adjustments related to prior recommendations		$0	$0	$0
Total of Reports with Cost Sharing Findings (A+B+C)	1	$0	$141,114	$0
D. For which a management decision was made during the reporting period:	N/A	$0	$0	$0
1. Dollar value of cost-sharing shortfall that grantee agreed to provide	N/A	N/A	$0	$0
2. Dollar value of cost-sharing shortfall that management waived	N/A	N/A	$0	$0
E. Reports with monetary findings for which no management decision has been made by the end of the reporting period	1	$0	$141,114	$0

Status of Recommendations Involving Internal NSF Management Operations

Open Recommendations (as of 9/30/04)
Recommendations Open at the Beginning of the
Reporting Period   **48**
New Recommendations Made During Reporting Period   **27**
Total Recommendations to be Addressed   **75**

Management Resolution of Recommendations[12]
Awaiting Resolution   **49**
Resolved Consistent With OIG Recommendations   **26**

Management Decision That No Action is Required   **0**

Final Action on OIG Recommendations[13]
Final Action Completed   **13**
Recommendations Open at End of Period   **62**

Aging of Open Recommendations

Awaiting Management Resolution:
0 through 6 months   **43**
7 through 12 months   **0**
More than 12 months   **6**

Awaiting Final Action After Resolution:
0 through 6 months   **2**
7 through 12 months   **5**
More than 12 months   **6**

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[12] "Management Resolution" occurs when the OIG and NSF management agree on the corrective action plan that will be implemented in response to the audit recommendations.
[13] "Final Action" occurs when management has completed all actions it agreed to in the corrective action plan.

List of Reports

NSF and CPA Performed Reviews

Report Number	Subject	Questioned Costs	Unsupported Costs	Better Use of Funds	Cost Sharing At-Risk
04-1-008	Community College	$1,150,840	$1,150,840	$0	$141,114
04-1-009	Scientific Society	$0	$0	$0	$0
04-2-003	NSF internal review	$0	$0	$0	$0
04-2-005	NSF program report	$0	$0	$0	$0
04-2-006	NSF internal review	$0	$0	$0	$0
04-2-007	NSF internal review	$67,837	$0	$174,370	$0
04-2-008	NSF internal review	$0	$0	$0	$0
04-6-002	NSF Contractor	$0	$0	$0	$0
04-6-003	NSF Contractor	$0	$0	$0	$0
04-5-004	Research Foundation	$0	$0	$0	$0
	Total:	**$1,218,677**	**$1,150,840**	**$174,370**	**$141,114**

NSF-Cognizant Reports

Report Number	Subject	Questioned Costs	Unsupported Costs	Cost Sharing At-Risk
04-4-009	School corporation	$0	$0	$0
04-4-023	Research foundation	$0	$0	$0
04-4-026	K-12 School	$0	$0	$0
04-4-027	Nonprofit corporation	$5,470	$0	$0
04-4-029	Research center	$0	$0	$0
04-4-030	Nonprofit organization	$0	$0	$0
04-4-031	Consortium	$0	$0	$0
04-4-032	School district	$0	$0	$0
04-4-033	Conservation organization	$0	$0	$0
04-4-034	Educational research company	$0	$0	$0
04-4-035	Museum	$0	$0	$0
04-4-036	School district	$0	$0	$0
04-4-037	School district	$0	$0	$0
04-4-038	Educational research company	$0	$0	$0
04-4-040	K-12 school	$0	$0	$0
04-4-042	Research institute	$0	$0	$0
04-4-043	College	$0	$0	$0
04-4-044	State university	$0	$0	$0
	Total:	**$5,470**	**$0**	**$0**

Other Federal Audits

Report Number	Subject	Questioned Costs	Unsupported Costs	Cost Sharing At-Risk
04-5-056	Community college	$58,000	$0	$0
04-5-057	University	$25,100	$25,100	$0
04-5-061	Corporation	$944	$944	$0
04-5-081	College	$78,369	$0	$0
04-5-088	College	$14,176	$0	$0
04-5-095	Corporation	$485	$0	$0
04-5-099	University	$694	$0	$0
04-5-102	University	$9,997	$0	$0
04-5-104	University	$18,600	$0	$0
04-5-106	Institute	$18,471	$0	$0
04-5-110	University	$415,500	$0	$0
04-5-111	University	$51,968	$0	$0
04-5-113	State Government	$378	$0	$0
04-5-114	Corporation	$191	$0	$0
04-5-115	University	$344,043	$0	$0
04-5-123	Corporation	$3,998	$0	$0
04-5-124	College	$6,689	$0	$0
04-5-125	College	$1,014	$0	$0
04-5-126	University	$170,199	$0	$0
	Total:	**$1,218,816**	**$26,044**	**$0**

Audit Reports With Outstanding Management Decisions

This section identifies audit reports involving questioned costs, funds put to better use, and cost sharing at risk where management had not made a final decision on the corrective action necessary for report resolution within 6 months of the report's issue date. At the end of the reporting period there were two reports remaining that met this condition. The status of recommendations that involve internal NSF management is described on page 40.

Investigations Case Activity

April 1, 2004 - September 30, 2004

	Preliminary	Civil/Criminal	Administrative	Total
Active Cases at Beginning of Period	34	66	54	154
Opened Cases	144	20	44	208
Closed Cases	105	38	51	194
Active Cases at End of Period	73	48	47	168

Investigations Case Statistics

Referrals to DOJ	3
Criminal Convictions/Pleas	1
Civil Settlements	0
Administrative Actions	11
Investigative Recoveries	$522,387
Research Misconduct Findings by NSF	1
Cases Forwarded to NSF Management for Action	15
Cases Forwarded to NSF Management in Prior Periods Awaiting Action	2
Assurances and Certifications[14]	
Number of Cases Requiring Assurances During This Period	1
Number of Cases Requiring Certifications During This Period	1
Assurances Received During This Period	1
Certifications Received During This Period	0
Number of Debarments in Effect During This Period	7

[14] NSF accompanies some actions with a certification and/or assurance requirement. For example, for a specified period, the subject may be required to confidentially submit to OIG a personal certification and/or institutional assurance that any newly submitted NSF proposal does not contain anything that violates NSF regulations.

Freedom of Information Act and Privacy Act Requests

Our office responds to requests for information contained in our files under the Freedom of Information Act ("FOIA," 5 U.S.C. paragraph 552) and the Privacy Act (5 U.S.C. paragraph 552a). During this reporting period:

- We received 19 FOIA requests. The response time ranged between 1 day and 22 days, with a median of 20 days and the average around 12 days.

- We received 2 Privacy Act requests.

- We received 1 appeal, which was denied.

October 15, 2004

MEMORANDUM

To: Dr. Warren Washington
Chair, National Science Board

Dr. Arden Bement
Acting Director, National Science Foundation

From: Dr. Christine C. Boesz
Inspector General, National Science Foundation

Subject: Management Challenges for NSF in FY 2005

In accordance with the Reports Consolidation Act of 2000, I am submitting our annual statement summarizing what the Office of Inspector General (OIG) considers to be the most serious management and performance challenges facing the National Science Foundation (NSF). We have compiled this list based on our audit work, general knowledge of the agency's operations, and the evaluative reports of others, such as GAO and NSF's various advisory committees, contractors, and staff.

The challenges are unchanged from last year, mainly because they reflect areas of fundamental program risk that continue to pose obstacles to NSF's accomplishment of its mission. They will therefore require ongoing attention from NSF management over the long term. We have duly noted NSF's progress over the last year on many of the challenges listed, although much remains to be done.

The 11 specific challenges fall into five general categories, the first four of which are linked to the President's Management Agenda: 1) strategic management of agency resources, 2) improved financial performance, 3) expanded electronic government, 4) budget and performance integration, and 5) program-specific challenges.

If you have any questions or need additional information, please call me at 703-292-7100.

1. Strategic Management of Agency Resources

Workforce Planning and Training

Workforce planning continues to be one of the most serious challenges facing NSF. Since 1999 the number of proposals processed has increased by 40 percent, while the number of program officers assigned to their review has remained relatively flat. Last year alone, the number of proposals increased by 14 percent to 40,075, the largest annual percentage increase in over a decade. The quantity of proposals transmitted to NSF is perhaps the single best indicator of its overall workload. According to NSF, program officers now spend 55 percent of their time on merit review, leaving less time available for other important responsibilities such as award management and oversight and program planning[1].

NSF's reliance on "non-permanent" personnel is another area of concern. Forty-seven percent of NSF's 700 science and engineering staff are either visiting personnel, temporary employees, or intermittent employees. Visiting personnel make an important contribution to NSF's mission by enabling the agency to refresh and supplement the knowledge base of its permanent professional staff. But managers who serve at NSF on a temporary basis frequently lack institutional knowledge and are less likely or able to make long-term planning a priority. In fact NSF's *Business Analysis* project (a multi-year review aimed at reengineering the agency's core business processes) reports that NSF in general is spending less time on forward-looking activities such as strategic planning and program development. Moreover, there are administrative costs that NSF incurs in recruiting, hiring, processing, and training personnel that rotate every 1 to 4 years. In FY 2004, we conducted an audit that identified the additional salary, fringe benefits, travel and other costs of visiting or temporary personnel, and found three areas where NSF could improve its administration of the programs[2]. Therefore, while visiting personnel are an important resource for NSF, the agency must continually balance the benefits of their services against the additional costs involved.

The agency's response to these and other workforce issues is being formulated as part of the *Business Analysis*, which is scheduled for completion by the end of FY 2005. In FY 2004, NSF initiated an agency-wide workforce planning effort based on the findings of the business analysis to date. NSF's

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[1] Report to the National Science Board on NSF's Merit Review Process FY 2003 (May 2004)

[2] Audit of Costs Associated with Visiting Personnel, July 23, 2004, OIG 04-2-006. Opportunities for improvement cited in the report include consulting income documenta-tion, IPA pay computations, and VSEE cost of living adjustments.

Human Capital Management Plan, which was delivered in December 2003, integrates and links Human Capital activities to the NSF business plan and to the Human Capital Assessment and Accountability Framework provided by the Office of Personnel Management. While the current plan provides a roadmap for identifying NSF's future workforce needs, the needs themselves are still in the process of being defined.

Administrative Infrastructure

A shortage of administrative resources continues to hinder NSF's staff from keeping pace with its growing workload. NSF states that over the past year it has leased an additional 26,576 square feet of space and the travel budget increased from $4.32 million in FY 2003 to $6.05 million in FY 2004 to support the merit review process and increase oversight activities. Management reports that it conducts ongoing assessments of space management and allocation in addition to its regular budget analysis and planning activities. It also encourages video conferencing and telecommuting as methods of leveraging scarce administrative resources.

While these efforts provided some relief, more than a third of the management control weaknesses cited by NSF's managers in the agency's FY 2004 controls assessment involves a shortage of human or administrative resources. Space remains a critical issue, impeding the recruitment of quality staff and the ability to store sensitive documents. In some cases, program officers are sharing cubicles, while contractors are located in file rooms. Travel funds were repeatedly cited as inadequate for the purpose of properly overseeing existing awards. NSF must make it a priority to allocate more of its funding for administrative resources in order to maximize the effectiveness of staff.

2. Improved Financial Performance

Management of Large Infrastructure Projects

NSF's investment in large facilities and infrastructure projects presents management with a number of budgetary and operational challenges. The construction of projects such as telescopes, research equipment, supercomputing databases, and earthquake simulators are inherently risky due to their complex design, cutting-edge technology, and expense. A disciplined project management approach is essential to success; at the same time, modifications are sometimes necessary when developing a new technological tool. NSF spends approximately $1.1 billion a year on these scientific tools, with many of the projects costing as much as several hundred million dollars each.

NSF continues to make measured progress towards addressing the recommendations we offered during two past audits of large facility projects[3]. Our audit reports identified the need to improve oversight of large projects by enhancing organizational accountability, providing better guidance (particularly in the area of financial management), and improving NSF's systems to capture complete information about project costs. During the past two years, NSF has hired a Deputy Director for Large Facility Projects and developed more detailed guidance to support its *Facilities Management and Oversight Guide.*

However, we remain concerned that NSF does not have adequate staff assigned to oversee and manage large projects, and that those assigned may not have sufficient resources or authority to carry out their responsibilities. In addition, many of the modules intended to support the *Facilities Management and Oversight Guide* are still under development, including those pertaining to financial management. Finally, the problem of recording and tracking the full costs of projects has not yet been addressed. A contract to enhance the financial system for tracking life cycle costs of Major Research Equipment and Facilities Construction projects was awarded at the end of FY 2004.

Post-Award Administration

Since FY 2002, independent audits of NSF's financial statements have cited weaknesses in the agency's post-award monitoring of grantee institutions as a major deficiency. An effective post-award monitoring program should ensure that: awardees are complying with award terms and conditions and federal regulations; adequate progress is being made toward achieving the objectives and milestones of the program; and expenditures listed on NSF's financial statements are accurate. While NSF has taken some steps over the past three years toward establishing a risk-based program for post-award monitoring of its grants, more needs to be done. NSF must broaden its approach to award monitoring to go beyond high-risk awardees, develop more effective award oversight guidance, and increase the coordination between program and financial officers.

In FY 2004, NSF reorganized the Office of Budget, Finance and Award Management to establish the Division of Institution and Award Support. The Division's role is to manage federal funds awarded by NSF, including providing financial and administrative assistance to institutional awardees and NSF

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[3] Audit of the Financial Management of the Gemini Project, December 15, 2000, OIG 01-2001
Audit of Funding for Major Research Equipment and Facilities, May 1, 2002, OIG 02-2007

directorates to implement business models, processes and practices. In addition, NSF has increased its outreach to at-risk institutions and developed creative ideas for partnering with other agencies to monitor common grantees. Together these actions represent progress toward addressing post-award administration issues at NSF.

However, NSF's approach to post-award administration focuses too narrowly on high-risk awardees. Because the agency considers only 42 out of its 34,011 awards to be high-risk, the impact of the Award Monitoring and Business Assistance Program (AMBAP) is effectively limited to 0.1% of its award portfolio. To broaden the scope of its activities, NSF should apply more cost-effective monitoring procedures such as desk reviews of reports from awardees and computer-assisted screening to medium and low risk awardees on a random basis.

NSF also issued an award-monitoring guide in FY 2002 and a revised site-visit guide in FY 2003 for agency staff; however, both guides need improvement. In an assessment of NSF's post-award monitoring efforts, IBM Business Consulting commented, "the staff did not follow or only loosely followed the AMBAP guide noting that it was too broad and extensive to be implemented in a realistic timeframe." Meanwhile, the site visit guide does not address many important details for conducting a review, such as how and what types of reviews should be conducted, and therefore does not assure quality or consistency.

The site-visit guide does not standardize documentation for performing or recording the results of the review, thereby increasing the risk that procedures may not be consistently applied. IBM noted that this lack of documentation undermined the follow-up of site visits, and recommended standardized procedures for writing the report, following up, and maintaining documentation in a database for analysis of overall findings. Furthermore, in a recent audit report we cited close coordination between the program and administrative offices as an effective practice of organizations engaged in post-award monitoring and oversight[4]. NSF should seek to develop one comprehensive approach to award monitoring that would include both a financial and programmatic component.

Finally, the Improper Payments Improvement Act of 2002 requires agencies to review all programs and activities annually and identify those that are susceptible to significant improper payments. In May of 2003, the Office of Management and Budget (OMB) issued guidance requiring agencies to

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[4] Management Framework: Award Monitoring; September 30, 2003; OIG 03-2-015

statistically sample those programs at high risk for improper payments and establish baseline error rates and improvement targets for future reporting. NSF, like other grant making agencies, is challenged to implement the OMB requirements. Since improper payments include those made by NSF's awardees and subawardees, designing a methodology to statistically sample the voluminous number of payments made by NSF's 2500 awardees is complex.

Cost Sharing

Cost sharing refers to the contribution of financial or in-kind support by recipients of federal grants to the cost of their research projects. Federal guidelines require that the accounting of cost-shared expenses be treated in a manner consistent with federal expenditures. However, our past audit work indicates that many awardees do not adequately account for or substantiate the value of cost-shared expenditures, raising questions about whether required contributions are actually being made.

Two years ago, NSF changed its policy to require cost sharing above the statutory requirement *only when there is tangible benefit to the awardee*, such as a facility that will outlast the life of the research project or income derived by the awardee as a result of the research. There is evidence that the new policy has effectively curtailed new cost sharing agreements. The number of new awards that include cost sharing declined from 3346 in FY 2001 to just 1556 during FY 2004. During the same period, the amount of promised cost sharing declined by 54 percent. Less cost sharing reduces the potential for compliance problems and the burden on the agency for correcting them.

While reducing cost sharing requirements mitigates the challenge, it does not eliminate it since some cost sharing is required by statute and some is voluntary. The agency states that it is providing greater oversight in the risk assessment protocol and site reviews. Cost sharing is also identified as a high-risk factor and a focus of the new protocol. It is too early to assess the effectiveness of these efforts. In October, the agency acted to eliminate future cost sharing except for what is required by statute. The policy is likely to further reduce the amount of cost sharing entered into by the agency but to what extent is not known. We will continue to monitor the substantial amount of cost shared funds still outstanding and reassess changes brought about by the new policy.

3. Expanded Electronic Government

Information Security

NSF must have a comprehensive and effective information technology (IT) security program both to meet Federal requirements and to mitigate risks that threaten the successful operation and development of its IT systems. These systems and the information they contain need to be protected from unauthorized access, use, disclosure, disruption, modification, and destruction. Over the past several years, NSF has taken a number of steps to strengthen its IT security program. For example, it formed a Security Working Group comprised of managers from across the agency to set NSF policy and procedures, and established a new security office to implement them. All staff are required to complete security awareness training each year. NSF has undertaken penetration testing of its systems in order to find and address vulnerabilities more quickly. In addition, the agency completed the certification and accreditation of 18 of its 19 general support systems and major applications by the end of FY 2003, and in FY 2004 began a triennial cycle of recertification of all systems. Also in FY 2004, the Office of Polar Programs completed a comprehensive inventory of the systems supporting the U.S. Antarctic Program (USAP), classifying them as one general support system and two major applications, rather than one major application as they had been classified in 2003. The agency plans to certify and accredit those systems by the end of CY 2004,

Despite these accomplishments, IT security is an ongoing challenge for NSF, as for all federal agencies, and some weaknesses remain. The OIG's FY 2004 Federal Information Security Management Act (FISMA) report issued on June 30, 2004, noted that the systems serving the USAP still had not been certified and accredited, information security policies had not been established and implemented, and required background investigations for key information security personnel had not been performed. Our review also found that NSF had not updated its risk assessments and security plans to account for the migration of its payroll and personnel systems to another federal agency, NSF's disaster recovery plan had not been fully tested, and access controls could be strengthened. These vulnerabilities could result in unauthorized access to and modification of financial, programmatic, and other sensitive information; loss of assets; health and safety risks; and disruption of critical operations and the ensuing costs associated with business downtime and recovery. NSF has reported that it has made significant progress in all these areas since our review.

4. Budget and Performance Integration

GPRA Reporting

Congress enacted the Government Performance and Results Act (GPRA) in 1993 as a means of making government more results oriented. The Act requires each agency to develop a strategic plan that establishes specific goals against which its performance can be objectively evaluated. To further focus government agencies on results, the President's Management Agenda requires that performance be considered in funding and management decisions and that programs work toward continual improvement. In support of these objectives, OMB introduced the Program Assessment Rating Tool (PART) to provide a framework for evaluating performance and generate program effectiveness ratings for Congress to consider when making budget decisions.

GPRA poses a significant challenge to agencies involved in science or education research because the benefits are difficult to measure and may only become apparent over time. Moreover performance measures must be carefully formulated so as not to discourage appropriate high-risk research that offers the potential for a "transformational" discovery. Because of the complexity involved in measuring the benefits of research, a full discussion of the methodology employed in reporting performance results should be prominently included in each performance report. Last year we issued an audit report on the Committee of Visitors panels that are used by NSF to provide qualitative data for GPRA reporting. We found that some of the limitations associated with the use of the data were not fully disclosed in the agency's GPRA report. Further, we noted that NSF relied on judgmentally selected "nuggets" (research success stories) as evidence that it has achieved its GPRA goals, again without full disclosure. Our report indicated that a user of NSF's performance report might infer that the nuggets are representative of the performance of the entire portfolio, and the credibility of the reports could become compromised. We recommended that NSF more clearly disclose the limitations associated with both issues.

In FY 2004, NSF has expanded its disclosure of the methodology it employed and while this disclosure has resolved the issues raised in the audit report, we continue to believe NSF should report on the performance results of its entire research portfolio. To do this, NSF will need to develop a knowledge management system to capture, categorize and analyze the research results.

Cost Accounting

An effective accounting and reporting system is essential to attaining the objectives of the President's Management Agenda and complying with GPRA. However, NSF's current information systems do not readily provide the cost accounting information necessary to link its costs to program performance. While NSF has been a leader in generating annual financial statements that have received "unqualified" audit opinions for the past six years, it is only beginning to focus on developing a cost accounting system to address its program performance evaluation and reporting needs.

For the past four years, each financial statement audit has recommended that NSF identify management cost information requirements for each organizational unit or program, establish activities/projects and corresponding outcomes within each unit, and develop and report cost efficiency measures that align with outputs and outcome goals. The auditors have also noted that NSF's systems do not track complete cost data for projects in which the costs are borne by more than one NSF directorate or organizational unit. Consequently, program officers cannot monitor the full cost of a project.

In FY 2004, NSF management developed a Budget, Cost and Performance Integration (BCPI) work plan that was approved by OMB. The agency states that cost accounting is a key element of the BCPI plan. A crosswalk was developed between the costs accounted for in the appropriations reporting system and those in the new programmatic reporting framework. When NSF is able to interface the crosswalk with the Financial Accounting System, the agency will be able to identify the full direct costs of its programs and projects, including its large facility projects. However, the plan does not provide for tracking costs of NSF's internal business processes and activities such as the cost of soliciting grants, conducting merit reviews, or performing post-award grant administration. Identifying the costs of these internal functions is important for evaluating NSF's performance accomplishments under its organizational excellence strategic goal.

5. NSF Program-Specific Challenges

Management of U.S. Antarctic Program

As part of its mission, NSF finances and supports Antarctic research, providing over $197 million in FY 2004 for research activities in Antarctica. Its single largest award is a contract for Antarctic logistics and support services valued at $1.116 billion over 10 years. Each year the United States Antarctic

Program (USAP) deploys about 700 people to the continent to perform scientific research and another 2,500 to provide logistics in support of this research, including the operation and maintenance of year-round research stations. Those deployed include research teams from academia, industry, and government, military personnel, and contractor employees.

NSF's contract for Antarctic support contains many inherent risks and complex requirements. The contractor must have technical expertise in a variety of disciplines, including medical and environmental engineering, and is responsible for managing a number of subcontractors in the U.S. and overseas. Therefore, NSF's oversight of the programmatic and financial performance of this large contract is itself a formidable challenge, requiring considerable administrative and technical skill. The remote and harsh Antarctic landscape leaves little margin of error for many basic support activities. For example, weaknesses in the USAP information system were cited as a reportable condition during the agency's most recent IT audit since they could potentially disrupt essential life support or science activities. The agency also has yet to resolve an outstanding recommendation from an audit report issued last year aimed at strengthening the USAP's capital asset management program and renewing its aging infrastructure. The issue involves how best to assure funding is available to maintain the infrastructure in a timely manner. NSF comments that it has sustained an ongoing effort to maintain and upgrade facilities at McMurdo and Palmer Stations, albeit at a slower pace than is ideal, and affirms that the USAP is providing a safe and healthy environment.

A recent audit identified instances of overbilling by the contractor. Consequently, the OIG is planning to conduct a financial and compliance audit of the Antarctic Logistics and Support Contractor that will include a review of internal controls over cash management and compliance with various fund restrictions. We will also continue to monitor its information systems.

Broadening Participation in the Merit Review Process

The merit review process is a cornerstone of NSF's operations, ensuring the integrity and fairness of the proposal review process and maintaining the high standards of excellence for which NSF is known. NSF was able to fund only 27 percent of the more than 40,000 proposals it received in FY 2003. The agency decides which research, engineering and education projects to fund by subjecting most proposals to a rigorous merit review process that ensures each will receive knowledgeable and unbiased consideration based on specific criteria. It is largely through the merit review system that NSF adds value to the national research and education enterprise. One objective in NSF's Strategic Plan is to increase the participation of underrepresented

groups and institutions in all NSF programs and activities, including merit review. Developing the untapped potential of underrepresented groups should lead to expanded individual opportunity and improved national competitiveness and prosperity.

During FY 2003, the percentage of underrepresented groups that received awards remained steady, with female and minority PIs funded at approximately the same rate as the overall proposer population. The number of awards made to minority PIs remains at 5 percent of total awards. Beginning in FY 2001, NSF started requesting demographic data from all merit panel reviewers to determine the extent of participation of underrepresented groups in the NSF reviewer population. However, NSF cannot legally require reviewers to provide demographic information. In FY 2003, out of a total of 40,020 reviewers who returned reviews, only 5,336 provided demographic information. Thirty-four percent of those indicated they were members of an underrepresented group. In FY 2004, NSF continued to use seminars and workshops at minority-serving institutions in an effort to expand interest in NSF's programs. Reviewer diversity is emphasized through the use of a large and expanding Foundation-wide reviewer database, explicit policy guidance, mandatory training for all program officers, and directorate-level initiatives. The agency will also continue to request demographic information and adjust the FastLane reviewer module to make it more convenient for reviewers to provide such information.

Math and Science Partnership

NSF has responsibility for the Math and Science Partnership (MSP) program, a key element of the President's initiative, *No Child Left Behind*, aimed at strengthening and reforming K-12 education. In FY 2002 and 2003, NSF awarded a total of $280 million to fund partnerships between school districts, colleges and universities, and other organizations for the purpose of improving math and science education at the K-12 level. NSF has requested an additional $80 million to support ongoing activities of the MSP program in FY 2005. The program poses several challenges for NSF, including the need to facilitate partnerships among institutions that do not normally collaborate, monitor awardees that are unaccustomed to handling federal funds, and ensure that projects are implemented as proposed and have effective evaluation plans that adequately report their impact on student achievement.

In a recent report, we reviewed the evaluation plans for nine of the first 23 MSP projects and found that five had effective evaluation plans. The other four projects in our sample were missing key elements of an effective evaluation process. In response to this finding, NSF plans to enlist the help of evaluation

experts to frame a statement of practice to serve as a framework for current and future MSP award recipients. We also recommended that the agency develop a comprehensive management plan for evaluating the MSP program. An award for an external evaluation of the MSP program consistent with the research and development nature of the program was recently made.

Reporting Requirements

Under the Inspector General Act, we report to the Congress every six months on the following activities:

- Reports issued, significant problems identified, the value of questioned costs and recommendations that funds be put to better use, and NSF's decisions in response (or, if none, an explanation of why and a desired timetable for such decisions). (See p.p. 5,13,35)

- Matters referred to prosecutors, and the resulting prosecutions and convictions. (See p.p. 25, 46-47)

- Revisions to significant management decisions on previously reported recommendations, and significant recommendations for which NSF has not completed its response. (See p.45)

- Legislation and regulations that may affect the efficiency or integrity of NSF's programs. (See p. 8)

- OIG disagreement with any significant decision by NSF management. (None)

- Any matter in which the agency unreasonably refused to provide us with information or assistance. (None)

Acronyms

AIGI	Associate IG for Investigations
AMBAP	Award Monitoring and Business Assistance Program
ARMS	Australian Research Management Society
BCPI	Budget, Cost and Performance Integration
CFO	Chief Financial Officer
CIO	Chief Information Officer
COI	Conflict of Interest
COV	Committee of Visitors
DACS	Division of Acquisition and Cost Support
DCAA	Defense Contract Audit Agency
DD	Division Director
DFE	Designated Federal Entity
DGA	Division of Grants and Agreements
DOJ	Department of Justice
ECIE	Executive Council of Integrity and Efficiency
FDP	Federal Demonstration Partnership
FISMA	Federal Information Security Management Act
FOIA	Freedom of Information Act
FY	Fiscal Year
G&A	General & Administrative
GAO	General Accounting Office
GPM	Grant Policy Manual
GPRA	Government Performance and Results Act
IDR	Illinois Department of Revenue
IG	Inspector General
IPA	Intergovernmental Personnel Act
IRB	Institutional Review Board
IR/D	Individual Research and Development
MRE	Major Research Equipment
MREFC	Major Research Equipment and Facilities Construction
MSP	Math and Science Partnership
NCURA	National Council of University Research Administrators
NSB	National Science Board
NSF	National Science Foundation
OIG	Office of Inspector General
OMB	Office of Management and Budget
OPP	Office of Polar Programs
ORI	Office of Research Integrity

Acronyms (cont'd)

PART	Program Assessment Rating Tool
PCIE	President's Council on Integrity and Efficiency
PHS	Public Health Service
PI	Principal Investigator
PFCRA	Program Fraud Civil Remedies Act
REU	Research Experiences for Undergraduates
SBIR	Small Business Innovation Research
STC	Science and Technology Centers
USAP	United States Antarctic Program
VSEE	Visiting Scientists, Engineers and Educators

Awards

Dr. Boesz congratulates Peggy Fischer and Ginna Ingram on receiving the PCIE/ECIE Award for Excellence for "Leadership in Development of the Investigations Peer Review Process".

Debbie Hunter, Elizabeth Goebels, Jill Schamberger and Keri Campbell received the PCIE/ECIE Award for Excellence for their audit of the Math and Science Partnership Program.

OIG staff Jannifer Jenkins, Catherine Walters, Joel Grover and NSF colleagues display their Collaborative Integration Award for meeting the government's accelerated schedule for producing the Performance and Accountability Report.

Dr. Boesz and Veronica Bankins congratulate Laurie Pena-Ariet as she receives an award for exceptional efforts in planning OIG's office space.

Organization Chart

INSPECTOR GENERAL

Christine C. Boesz

DEPUTY INSPECTOR GENERAL

Tim Cross

COUNSEL TO THE INSPECTOR GENERAL

Arthur A. Elkins

ASSOCIATE IG FOR AUDIT

Deborah H. Cureton

ASSOCIATE IG FOR INVESTIGATIONS

Peggy L. Fischer

AUDIT STAFF

ADMINISTRATIVE STAFF

INVESTIGATIVE STAFF