

STATEMENT OF
DR. CHRISTINE C. BOESZ
INSPECTOR GENERAL
NATIONAL SCIENCE FOUNDATION

before the

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE
SUBCOMMITTEE ON RESEARCH

March 9, 2005

Chairman Inglis, Ranking Member Hooley, and distinguished members of the Subcommittee, I appreciate the opportunity to appear before you today. As you know, the National Science Foundation (NSF) is an innovative agency dedicated to maintaining American leadership in discovery and the development of new technologies across the frontiers of scientific and engineering research and education. As the scientific enterprise changes and research evolves, new challenges arise. Consequently, my office has worked closely with the National Science Board and NSF management to identify and begin to address issues that are important to the success of NSF achieving its goals.

As Inspector General, I enjoy a unique perspective on NSF activities and the research and education enterprise in general. My office is responsible for promoting economy, efficiency, and effectiveness in administering NSF's programs; detecting and preventing fraud, waste, and abuse within NSF or by individuals that submit proposals to or receive funding from NSF; and identifying and helping to resolve cases of research misconduct. My office also engages in outreach activities in an effort to build partnerships within the agency, other Federal agencies, NSF awardees, and the scientific, engineering, and education communities. These partnerships assist us in resolving audit and investigation matters effectively and promoting education on research misconduct and award administration issues. In addition to reports on individual audits and investigations, the two primary methods for formally communicating with the National Science Board, NSF management, and the Congress are through our Semiannual Reports and annual management challenges letters.

Management Challenges

This past October, my office conducted its annual assessment of the most serious management and performance challenges facing NSF.¹ My office compiled a list of eleven management challenges based on our audit work, general knowledge of

¹ Memorandum from Christine C. Boesz, Inspector General, National Science Foundation, to Warren Washington, Chairman, National Science Board, and Arden Bement, Acting Director, National Science Foundation (Oct. 15, 2004) (on file with NSF OIG).

the agency's operations, and the evaluative reports of others, such as the Government Accountability Office and NSF's various advisory committees, contractors, and staff. These challenges, which are essentially unchanged from our previous assessment,² fall into five general categories: 1) strategic management of agency resources, 2) improved financial performance, 3) expanded electronic government, 4) budget and performance integration, and 5) program-specific challenges.

I believe that the two most important challenges are related to the first two of these general categories, which encompass both the short-term and long-term needs of NSF. The strategic management of NSF resources is an ongoing and pressing issue. NSF needs to devote more resources and attention to making business and process improvements, while at the same time, planning for its future workforce needs. Although advances in technology have enhanced the workforce's productivity, NSF's rapidly increasing workload has forced the agency to become increasingly dependent on temporary staff (e.g., rotators and visiting scientists) and contractors to handle the additional work. NSF's efforts in the past to justify an increase in staff have been impeded by the lack of a comprehensive workforce plan that identifies workforce gaps and outlines specific actions for addressing them. Without such a plan, NSF cannot determine whether it has the appropriate number of people or the types of competencies necessary to accomplish its strategic goals. In 2002, NSF launched a multi-year business analysis effort to address this challenge. To date, NSF has made few decisions regarding implementation of a workforce plan. Without such a plan, NSF is unable to assess the number and skill-level of rotators and other personnel needed to carry out its work. Of particular concern is the need for resources to oversee NSF's large facility projects and carry out effective post award monitoring.

Throughout my five years as Inspector General of NSF, my office has increased its audit attention on matters related to NSF's management and oversight of its large facility project portfolio, which includes projects ranging from tens of millions to hundreds of millions of dollars. In 2000 and 2002, my office issued reports critical of NSF's management of large infrastructure projects and made recommendations for addressing this important piece of NSF's research portfolio.³ These recommendations urged NSF to establish formal guidance for the programmatic and financial management of large facilities, including full-cost tracking. An important aspect of NSF's plan to address these recommendations is the establishment of a Large Facility Project (LFP) Office with responsibility for managing and overseeing large facility projects. We reviewed the progress this Office is making in issuing project

² Memorandum from Christine C. Boesz, Inspector General, National Science Foundation, to Warren Washington, Chairman, National Science Board, and Rita R. Colwell, Director, National Science Foundation (Oct. 17, 2003) <http://www.nsf.gov/oig/managementchallenges2004.pdf>.

³ OFFICE OF INSPECTOR GENERAL, NATIONAL SCIENCE FOUNDATION, AUDIT OF THE FINANCIAL MANAGEMENT OF THE GEMINI PROJECT, Report No. 01-2-001 (Dec. 15, 2000); OFFICE OF INSPECTOR GENERAL, NATIONAL SCIENCE FOUNDATION, AUDIT OF FUNDING FOR MAJOR RESEARCH EQUIPMENT AND FACILITIES, Report No. 02-2-007 (May 1, 2002) (both on file with NSF OIG).

management guidance and providing oversight of current projects.⁴ The Office's progress has been slow and constrained by workload and staffing issues. Currently the LFP Office has 2.5 full-time-equivalent employees responsible for overseeing 13 projects, each of which is estimated to receive an average of \$100-400 million in total Major Research Equipment and Facilities Construction appropriation funding. While the LFP Office may have some access to other NSF staff to support its activities, I believe that dedicated resources, specific to the Office's oversight responsibilities, are essential. In addition to resources, however, and perhaps more importantly, the LFP Office needs organizational authority to independently oversee the management and construction of these projects, and a high-level champion to ensure that authority. I believe Dr. Arden Bement, as NSF Director, intends to be this champion. Further, the Office needs a more structured management approach that includes a formal mission statement, specific goals and measures, and a realistic staffing plan.

Finally, over the past five years, we have focused increasing audit efforts on addressing NSF's challenge to effectively administer and oversee all of its approximately 30,000 active grants and cooperative agreements once they have been awarded. Since 2002, four consecutive independent audits of NSF's financial statements have cited weaknesses in the agency's post-award monitoring of grantee institutions as a significant deficiency.⁵ Specifically, the auditors found that (1) NSF's current risk model for focusing its monitoring efforts does not adequately capture all high-risk awardees; (2) NSF's award-monitoring program does not address procedures for both baseline and advanced monitoring depending on the financial risk of the award; and (3) procedures for conducting on-site award monitoring at awardee institutions are not adequate for the performance of an effective on-site review. In addition, in the FY 2004 audit, the independent auditor identified a second reportable condition: contract monitoring. The auditors found that NSF does not adequately review public vouchers submitted by contractors receiving advance payments to ensure that the reported expenditures are proper and allowable under the contract. Without adequately performing such procedures, misstatements and unauthorized expenditures may go undetected.

⁴ OFFICE OF INSPECTOR GENERAL, NATIONAL SCIENCE FOUNDATION, SURVEY OF LARGE FACILITY PROJECTS MANAGEMENT AND OVERSIGHT DIVISION, Report No. 05-6-002 (Dec. 29, 2004) http://www.nsf.gov/oig/LFP_Report.pdf.

⁵ KPMG Auditor's Report, Fiscal Year 2004 National Science Foundation Financial Statement Audit (Nov. 12, 2004) (page III-45 of NSF's 2004 Accountability Report found at http://www.nsf.gov/pubs/2005/nsf0501/new_pdf/nsf0501.pdf); KPMG Auditor's Report, Fiscal Year 2003 National Science Foundation Financial Statement Audit (Nov. 17, 2003) (page III-43 of NSF's 2003 Accountability Report found at http://www.nsf.gov/pubs/2004/nsf0410/new_pdf/nsf0410final.pdf); KPMG Auditor's Report, Fiscal Year 2002 National Science Foundation Financial Statement Audit (Jan. 29, 2003) (page III-39 of NSF's 2002 Accountability Report found at <http://www.nsf.gov/pubs/2003/nsf03023/pdf/nsf03023final.pdf>); KPMG Auditor's Report, Fiscal Year 2001 National Science Foundation Financial Statement Audit (Jan. 18, 2002) (page 71 of NSF's 2001 Accountability Report found at <http://www.nsf.gov/pubs/2002/nsf02097/nsf02097.pdf>).

A recent audit by my office further highlights the need for increased post-award monitoring.⁶ My auditors found, over a five-year period, that approximately 47 percent of the 151,000 annual and final project reports required by the terms and conditions of NSF's grants and cooperative agreements were either submitted late or not at all. Of the 43,000 *final* project reports, 8 percent were never submitted, and 53 percent were submitted, on average, 5 months late. Of the 108,000 *annual* progress reports, 42 percent were never submitted. This is due in part because of a lack of emphasis placed on the importance of these reports, as evidenced by a lack of policies and infrastructure that facilitate the staff's ability to adequately address this key facet of award administration. Moreover, in 74 of 571 occurrences over the past 5 years, NSF provided additional funding, contrary to its own policy, to principal investigators who had not submitted final project reports for prior awards.

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 funded research project; and awardee expenditures listed on NSF's financial statements represent costs that are accurate and allowable. 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 the relatively few high-risk awardees,⁷ develop more effective award oversight guidance, and increase the coordination between program and financial officers. We have recently received and are currently reviewing an action plan from NSF that proposes to address these additional award-monitoring activities.

All of these challenges reflect areas of fundamental program risk that continue to pose barriers to NSF's accomplishment of its responsibilities. They will therefore require ongoing attention from NSF management over the long term. While NSF recognizes these challenges, progress has been slow and much remains to be done in order for NSF to become a more successful organization and better serve the research and education communities, which so heavily rely on it. In addition, NSF has results from its own consulting study of post-award monitoring, which includes specific recommended actions.⁸ Although NSF now recognizes that both post-award and contract monitoring activities are necessary, the next step is for NSF to more aggressively implement concrete actions that will mitigate my concerns. I am particularly concerned over NSF's response to the independent auditors finding of a reportable condition in the area of

⁶ OFFICE OF INSPECTOR GENERAL, NATIONAL SCIENCE FOUNDATION, AUDIT OF PROJECT REPORTING FOR NSF AWARDS, Report No. 05-2-006 (Dec. 13, 2004) <http://www.nsf.gov/oig/05-2-006Final.pdf>.

⁷ In FY 2004, NSF identified only 42 of its approximately 30,000 awards as "high risk" and did not include some awards that were known to be high risk. For FY 2005, NSF has revised its risk assessment model and has identified 252 awards as "high risk." While the revised model captures a greater number of risky awards, it still identifies less than 1 percent of NSF awards as "high risk."

⁸ NSF contracted with a consultant to assess NSF's post-award monitoring processes. The results of this assessment, issued in March 2004, indicated that while NSF made commendable efforts to develop policies and procedures, it still faces a number of challenges to achieve effective administration. Further, using other grant making agencies as a benchmark, the consultant identified gaps in NSF's post-award administration. IBM, *Post-Award Monitoring Assessment* (March 2004). NSF has not developed an action plan to address the reported opportunities for improvement.

contract monitoring. NSF's corrective action plan suggests that my office, rather than NSF staff, be responsible for the periodic testing of contract vouchers recommended by the auditors. Voucher examination is a basic accounting function that resides with management. As such, it would be inappropriate for my office to take on this management function in light of our statutory independence.

I realize that resources are needed for NSF to fully address these challenges. However, I also believe that realignment of NSF's management priorities should ease the resource burden. The nature of the scientific research enterprise has changed over the past few decades. Consequently, the programmatic and management challenges facing NSF have changed. NSF's assessment of needed resources should address its changing administrative challenges

Investigative and Audit Activities

In our most recent Semiannual Report to the Congress for the six-month period ending September 30, 2004, my office reported on numerous audit and investigative activities.⁹ During that time period, my office issued one interim and 10 final audit reports that contained over \$30 million in questioned costs, and made recommendations that would improve grants management controls and oversight processes at both NSF and its awardee institutions. We closed 38 civil/criminal cases and 51 administrative cases and our investigations recovered \$522,387. Three cases were referred to the Department of Justice for criminal prosecution and 15 administrative cases were forwarded to NSF management for action during this period. The following is a sample of investigations and audits that were reported in our most recent Semiannual Report.

Investigations

My office investigates allegations of wrongdoing involving organizations or individuals that receive awards from, conduct business with, or work for, NSF. In investigating these allegations we assess their seriousness and recommend proportionate action. When possible, we work in partnership with agencies and awardee institutions to resolve these issues. Where appropriate, the results of these investigations are referred to the Department of Justice or other prosecutorial authorities for criminal prosecution or civil litigation, or to NSF management for administrative resolution.

For example, as we reported in our most recent Semiannual Report, 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 as a result of our investigative efforts. The owner sent a progress report to NSF for his SBIR award that included research previously conducted by his company under an Air Force SBIR award. He also used Federal SBIR funds to pay for personal expenses, such as repairs

⁹ OFFICE OF INSPECTOR GENERAL, NATIONAL SCIENCE FOUNDATION, SEMIANNUAL REPORT TO THE CONGRESS (September 2004) <http://www.nsf.gov/pubs/2004/oigsept2004/oig2004sept.pdf>.

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 our investigation. We also recommended that NSF exclude through debarment the owner and his company from receiving funds from any Federal agency.

One of the more unique areas of investigation for my office is in the realm of research misconduct, specifically falsification of data, fabrication of results, and plagiarism. Research misconduct strikes at the core of NSF's mission, and is a special concern for my office. Although there is a strong sense of integrity within the scientific and engineering research communities, my office often receives allegations that result in misconduct findings. For example, after receiving an allegation that a postdoctoral scientist fabricated and falsified data in a published research paper, my office 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 prohibit him from receiving Federal funds, otherwise known as debarment, for two years.

In addition, my office recommended to NSF that it take action to protect Federal interests by debarring a researcher for two years for his fabricating the existence of and citations for two manuscripts referenced in his two NSF awards. An investigation by the researcher's university determined that he provided false biographical information as part of his NSF proposals. The researcher cited two manuscripts as "submitted to" two prominent journals, and also referenced a "submitted" manuscript within the text of the proposal for his NSF award. However, our investigation revealed that those manuscripts did not exist. The investigation also identified a pattern of misrepresentation by the researcher that extended over a 10-month period.

While the majority of our investigations involve individual actions, some involve entire organizations. For example, my office 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.¹⁰ 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

¹⁰ 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.

this issue and obtained a commitment from the university to work with each of them to resolve these overcharges.

Audits

Our audit activities have two primary thrusts that often complement each other. We conduct financial audits of NSF's awards and awardee institutions to determine whether costs claimed by awardees are allowable, reasonable, and were incurred for the benefit of NSF's award. These audits also seek to identify weaknesses in awardee's controls in accounting for and in administering their NSF awards to ensure that NSF funds are spent properly. In addition, we conduct internal audits, which are reviews of selected NSF programs and operations that provide policy makers and management with an independent appraisal of whether desired results and objectives are achieved efficiently, economically, and in accordance with prescribed laws, regulations, policies, and procedures.

Recent examples of both these types of audits include an audit of a foreign treaty organization that, since 1996, has received \$16.4 million in NSF awards for global change research.¹¹ The audit found that NSF, on behalf of the United States, is funding a disproportionate share of the organization's total costs. The U.S. contribution, which was initially expected to comprise 25 percent of the organization's total funds, actually represents 87 percent of its income from 1996 to 2003. This occurred because 18 other member countries did not provide research and operational contributions in the amounts originally committed. As a result, the foreign organization has 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 organization has not properly monitored its 14 research subawards valued at \$10.3 million. This resulted in serious problems with two subawards that can not adequately support their \$1.1 million of claimed costs. Given the lack of financial support by other member countries, we recommended that NSF work with the foreign organization's governing bodies 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 has agreed with the OIG recommendations and is implementing actions to address them.

My office also recently completed another audit of a foreign organization identifying similar award administration issues.¹² This audit found that NSF, along with three other Federal agencies, did not establish adequate grant agreements requiring the

¹¹ OFFICE OF INSPECTOR GENERAL, NATIONAL SCIENCE FOUNDATION, AUDIT OF INTER-AMERICAN INSTITUTE FOR GLOBAL CHANGE RESEARCH, Report. No. 04-2-007 (Sept. 30, 2004) <http://www.nsf.gov/oig/IAI-GCR.pdf>.

¹² OFFICE OF INSPECTOR GENERAL, NATIONAL SCIENCE FOUNDATION, AUDIT OF UNITED STATES-MEXICO FOUNDATION FOR SCIENCE, Report. No. 05-2-005 (Dec. 8, 2004) <http://www.nsf.gov/oig/USMFS05.pdf>.

foreign organization to comply with statutory funding requirements as a condition for receiving US monies for the organization's research endowment fund. Consequently, the organization did not provide 45 percent of its required matching contribution (\$5 million) or implement adequate financial controls to account for and administer almost \$11 million in US funds. We recommended that as the largest U.S. contributor, NSF bring these concerns to the attention of the President's Office of Science and Technology Policy (OSTP) in order to facilitate a coordinated U.S. effort to secure corrective actions on the part of the foreign organization. While NSF responded favorably to the audit report, it does not agree that it should take a leading role in coordinating corrective actions for the entire U.S. Government. Nevertheless, NSF does generally agree to implement the remaining audit recommendations to secure improved financial controls over its own contributions to the foreign organization. It is my opinion that NSF should take the lead to bring these matters to OSTP in order to coordinate the U.S. interests in obtaining the needed corrective actions from the foreign organization.

As another example, at NSF's request, my office contracted with the Defense Contract Audit Agency (DCAA) to perform a financial audit of NSF's Antarctic Support Services Contractor.¹³ This contractor is NSF's largest, providing logistics and support services estimated at approximately \$1.1 billion over ten years. 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 auditors questioned \$29.2 million because the Contractor improperly billed indirect costs to the contract.¹⁴ The auditors also questioned \$6.7 million because the Contractor claimed indirect costs that exceeded the limitations specified in the contract agreement. 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.

As a final example, my office conducted an internal, or performance audit of the Math and Science Partnership (MSP) Program.¹⁵ In FYs 2002 and 2003, NSF awarded a total of \$436.6 million for 35 comprehensive and targeted awards under this program. The audit objective was to determine the effectiveness of a sample of MSP projects' evaluation methods and measures to assess the impact of the intervention strategies on student achievement. This audit reviewed nine partnership projects funded in FY 2002 and found that five had effective evaluation plans designed to evaluate, define, and

¹³ OFFICE OF INSPECTOR GENERAL, NATIONAL SCIENCE FOUNDATION, AUDIT OF RAYTHEON POLAR SERVICES COMPANY'S INDIRECT COSTS CLAIMED FOR FISCAL YEARS 2000 TO 2002, Report. No. 04-1-010 (Sept. 30, 2004) (on file with NSF OIG).

¹⁴ 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.

¹⁵ OFFICE OF INSPECTOR GENERAL, NATIONAL SCIENCE FOUNDATION, AUDIT OF NSF'S MATH AND SCIENCE PARTNERSHIP PROGRAM, Report. No. 04-2-003 (May 14, 2004) <http://www.nsf.gov/oig/mspprogram.pdf>.

measure the impact of the intervention strategies, activities and outcomes on student achievement in math and science. While the remaining four projects did not address all the elements for an effective evaluation process, with appropriate guidance and monitoring NSF could ensure that each partnership had an effective evaluation process.

Through these audits, and others like them, my office is able to make recommendations to NSF management aimed at correcting specific problems found with programs and awards. For example, as a result of the audit of the MSP program, NSF convened a workshop of subject matter experts to prepare an evaluation statement for current and future MSP projects. The results of these audits and others help to inform our assessment of the most critical challenges facing NSF, and help my office focus its future audit efforts.

Chairman Inglis, this concludes my written statement. Thank you for the opportunity to share this information with you. I would be happy to answer any additional questions you or other members of the Subcommittee may have, or to elaborate on any of the issues that I have addressed today.

Contact Information

For information about this statement, please contact Dr. Christine C. Boesz at 703-292-7100 or cboesz@nsf.gov.