

## CHAPTER 3: APPENDICES

### APPENDIX 1: SUMMARY OF FINANCIAL STATEMENT AUDIT AND MANAGEMENT ASSURANCES

**Table 1.**  
**Summary of Financial Statement Audit**

Audit Opinion	<b>Unqualified</b>				
Restatement	<b>No</b>				
Material Weakness	Beginning Balance	New	Resolved	Consolidated	Ending Balance
Total Material Weaknesses	<b>0</b>	-	-	-	<b>0</b>

**Table 2.**  
**Summary of Management Assurances**

<b>Effectiveness of Internal Control over Financial Reporting (FMFIA § 2)</b>					
Statement of Assurance	<b>Unqualified</b>				
	Beginning Balance	New	Resolved	Consolidated	Ending Balance
Total Material Weaknesses	<b>0</b>	-	-	-	<b>0</b>

<b>Effectiveness of Internal Control over Operations (FMFIA § 2)</b>					
Statement of Assurance	<b>Unqualified</b>				
	Beginning Balance	New	Resolved	Consolidated	Ending Balance
Total Material Weaknesses	<b>0</b>	-	-	-	<b>0</b>

<b>Conformance with Financial Management System Requirements (FMFIA § 4)</b>					
Statement of Assurance	<b>Systems conform to financial management system requirements</b>				
	Beginning Balance	New	Resolved	Consolidated	Ending Balance
Total Non-Conformances	<b>0</b>	-	-	-	<b>0</b>

<b>Compliance with Federal Financial Management Improvement Act (FFMIA)</b>		
	Agency	Auditor
Overall Substantial Compliance	<b>Yes</b>	<b>Yes</b>
1. System Requirements	<b>Yes</b>	
2. Accounting Standards	<b>Yes</b>	
3. US Standard General Ledger at Transaction level	<b>Yes</b>	

**NATIONAL SCIENCE FOUNDATION**  
**FY 2009 IMPROPER PAYMENTS INFORMATION ACT REPORTING DETAILS**

- I. Describe your agency’s risk assessment(s), performed subsequent to compiling your full program inventory. List the risk-susceptible programs (i.e., programs that have a significant risk of improper payments based on OMB guidance thresholds) identified through your risk assessments. Be sure to include the programs previously identified in the former Section 57 of OMB Circular A-11.**

NSF’s risk assessment program applies to all award programs and activities that the National Science Foundation (NSF) funds through our Research & Related Activities (R&RA) and Education and Human Resources (EHR) appropriations. “Research and Education Grants and Cooperative Agreements” identified in the former Section 57 of Office of Management and Budget (OMB) Circular A-11 is included in these appropriations.

Risk Assessment and Asset Management

NSF has conducted a review of expenditure data and grant payments related to the Federal Cash Transactions Report (FCTR), in accordance with guidance issued in August 10, 2006, OMB memorandum M-06-23, *Appendix C to OMB Circular A-123*, which updated the Improper Payments Information Act of 2002 (IPIA). OMB guidance requires agencies to report on programs or activities with estimated improper payments exceeding \$10 million or 2.5 % of total outlays and then detail actions the agency is taking to reduce these payments. Under OMB Memorandum 03-13 dated May 21, 2003, OMB further defined “An erroneous or improper payment includes any payment that was made to an ineligible recipient or for an ineligible service.”

NSF contracted with McBride, Lock & Associates, Certified Public Accountants, to conduct a statistical review of NSF Federal Financial Report (FFR) and FCTR transactions that are received from grant recipients. Management Analysis, Incorporated (MAI) conducted the statistical sample determination under a subcontract agreement with McBride, Lock & Associates. Since there is a large quantity of FFR/FCTR transactions received each year the use of statistical sampling was applied in order to review FFR/FCTR transactions randomly to determine the degree of error in payments to grantees.

The ultimate purpose of the sampling was for NSF to comply with P.L. 107-300 requirements for agencies to estimate the value of improper payments to their grantees. This will help enhance the NSF extensive post award-monitoring program by initiating reviews of FFR/FCTR expenditures. These activities help assure the accountability of taxpayer dollars.

**II. Describe the statistical sampling process conducted to estimate the improper payment rate for each program identified.**

In accordance with the OMB guidance and formula, the Sampling Team analyzed NSF FFR/FCTR transaction data. FFR/FCTR transaction data analyzed was selected randomly from the entire Universe based upon the NSF approved sampling plan.

The Sampling Team sampled the FFR/FCTR Universe comprised of all FFR/FCTR transactions from the quarter ending December 31, 2007 through the quarter ending September 30, 2008 as the statistical population for review. The total statistical population encompassed each of the quarterly transactions for the respective grantee.

**SAMPLE SIZE DETERMINATION**

Sample size was determined in accordance with the Implementation Guidance for IPIA, PL 107-300, and specifically in the cited reference (Sampling of Populations: Methods and Applications, Levy and Lemeshow, 1999). The number of FFR/FCTR awards to be reviewed was calculated as:

$$n \geq (2.706*(1-P)) / ((.025/P)^2 * P)$$

The formula provides “n” that is the minimum sample size and “P” is the estimated percentage of erroneous payments. This equation is then based on a 90% confidence interval of plus or minus 2.5% (or 0.025) around the estimate of the percentage of erroneous payments.

The total Awards, with each of their quarterly submissions, are included in the Universe for the sample determination. Using the above formula applied to the standards in Table 1 the minimum number of samples to be reviewed are as follows:

<u>Sample Type</u>	<u>Total Universe Represented</u>	<u>% From Calculation</u>	<u>Minimum Sample to be Reviewed</u>
Improper Payments	161,692	0.077925%	126
Dollar Value Represented	\$ 4,645,429,941	0.077925%	\$ 361,995

The sample sizes determined by the above formula were also evaluated by MAI using other recognized equations and tables and found to be a reasonable level for sampling. However, it was recognized that the number of samples evaluated and fully reviewed must meet the minimum sample size, not just the samples pulled. As such, additional samples were pulled to ensure that the final amount was sufficient.

**ACTUAL SAMPLE DETERMINATION**

Samples were determined from the database using the MAI developed algorithm using random number generation that selected at random the specified number of Grant Award identifications and then randomly selected the quarter for which to be evaluated.

During the initial reviews of the data, it was determined that the data included significant zero entries for quarterly periods that were preceding the Grant Award effective date. For FY 2008, there are a total of 39,467 zero entries or 24.4% of the total FFR/FCTR transactions. Under the NSF General Grant Terms and Conditions, grant recipients can incur pre-award costs up to 90 days prior to the effective date of the award at their own risk. Therefore, NSF determined that transaction amounts other than zero with dates prior to the award effective date are valid transactions. NSF determined that zero entries for dates prior to the effective date of the awards represent invalid zero transaction amounts for sampling purposes, because incurring pre-award costs is an option for the grant recipients. This makes a zero amount for pre-award periods the standard for the vast majority of NSF grants. Since the entries may be non-applicable to the evaluation, they were identified in the sample list and annotated as not to be sampled nor counted in the sample number.

NSF determined that zero entries for quarterly periods during the performance period of the award were valid entries and were included in the final sample. Additional zero entries present in quarters that follow final payments of closed out awards were also not included in the final sample. OMB agreed with NSF's approach for handling zero entries. All samples identified to not be sampled were confirmed by NSF.

#### **SELECTED TRANSACTION SUPPORTING DOCUMENTATION**

Letters and electronic communication were sent to each grantee with the instructions to provide supporting documentation for one of their specific transactions included in the FFR/FCTR transaction list. The information received was then reviewed in accordance with applicable cost principles.

Reviews included, but were not limited to the following:

- Does the cost represent expressly unallowable cost as cited in the Cost Principles, Grant Policy Manual, and award terms and conditions?
- Is this a duplicative payment?
- Were the services or products provided?
- Were the costs incurred during the period of performance?
- Does the payment agree with the terms of sub-award agreement?
- Was there adequate documentation?

### **III. Explain the corrective actions your agency plans to implement to reduce the estimated rate of improper payments. Include in this discussion what is seen as the cause(s) of errors and the corresponding steps necessary to prevent future occurrences. If efforts are already underway, and/or have been ongoing for some length of time, it is appropriate to include that information in this section.**

Even though NSF did not meet the thresholds for significant improper payments, the agency will continue its robust risk-based post-award monitoring program which reviews for improper payments.

**IV. Improper Payment Reduction Outlook FY 2004 – FY 2012**

(\$ in millions)

	2004			2005			2009		
Program	Outlays	IP%	IP \$	Outlays	IP%	IP \$	Outlays	IP%	IP \$
R&RA and EHR	\$4,742	.093%	\$4.4	\$4,215	.025%	\$4.4	\$4,645	.00	\$0.0

	2010			2011			2012		
Program	Outlays	IP%	IP \$	Outlays	IP%	IP \$	Outlays	IP%	IP \$
R&RA and EHR	\$5,489	.04%	\$2.2	\$5,646	.04%	2.5	\$6,131	.04%	\$2.5

**Note:** From FY 2006 through FY 2008, NSF received relief from the annual IPIA reporting due to the very low improper payment rates reported in its FYs 2004 and 2005 Performance and Accountability Reports.

McBride, Lock & Associates reviewed each of the individual sub-transactions representing the FFR/FCTR. The results of their review were presented to MAI for analysis against the initial requirements. The initial review determined that the minimum number of samples audited was met to ensure that the results would be statistically sufficient. The first 126 samples (priority ordered) received and audited were used in the statistical evaluation to meet the minimum requirement. The FFR/FCTR total sample dollar amount was checked to ensure that the minimum sample dollar amount had also been met. The calculated error rate was determined based upon those sub-transaction FFR/FCTR that had errors against the total of sub-transactions sampled both in dollars and numbers. The error rate was then used to extrapolate the values to the FFR/FCTR sample total and then to the Universe.

The results indicate that the occurrence of improper payments is well below the significant standard of improper payments defined as a total of improper payments exceeding \$10 million and 2.5% of the total outlays as outlined by OMB Guidance.

**V. Discuss your agency’s Recovery Auditing effort, if applicable, including the amount of recoveries expected, the actions taken to recover them, and the business process changes and internal controls instituted and/or strengthened to prevent further occurrences. (This reporting replaces the original legislative requirement for reporting not later than 12/31/04.)**

Not applicable for NSF’s program of Research and Education Grants and Cooperative agreements.

**VI. Describe the steps the agency has taken and plans to take (including time line) to ensure that agency managers (including the agency head) are held accountable for reducing and recovering improper payments.**

NSF will continue its grant expenditure sampling process for improper payments and its internal risk based approach as part of an integrated and comprehensive grant monitoring program strategy. This strategy coupled with strong financial management controls will assist NSF to ensure that taxpayer dollars are spent wisely and efficiently.

**VII. A. Describe whether the agency has the information systems and other infrastructure it needs to reduce improper payments to the levels the agency has targeted.**

As stated in Section IV above, results indicate that the occurrence of improper payments is well below the significant standard of improper payments defined as a total of improper payments exceeding \$10 million and 2.5% of the total outlays as outlined by OMB Guidance. NSF will continue using its end-to-end award information systems and infrastructure, while evaluating future grant and core financial needs.

**B. If the agency does not have such systems and infrastructure, describe the resources the agency requested in its FY 2005 budget submission to Congress to obtain the necessary information systems and infrastructure.**

Not applicable.

**VIII. A description of any statutory or regulatory barriers that may limit the agencies' corrective actions in reducing improper payments.**

None currently identified.

**IX. Additional comments, if any, on overall agency efforts, specific programs, best practices, or common challenges identified, as a result of IPIA implementation.**

None.



National Science Foundation • 4201 Wilson Boulevard • Arlington, Virginia 22230  
Office of the Inspector General

October 16, 2009

MEMORANDUM

To: Dr. Steven C. Beering  
Chair, National Science Board

Dr. Arden Bement  
Director, National Science Foundation

From: Allison Lerner *Allison C. Lerner*  
Inspector General, National Science Foundation

Subject: Management Challenges for NSF in FY 2010

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 and investigative work, general knowledge of the agency’s operations, and the evaluative reports of others, including the Government Accountability Office and NSF’s various advisory committees, contractors, and staff.

This year we have taken a fresh look at the challenges that NSF faces and have focused on six issue areas that reflect fundamental program risk, and are likely to require management’s attention for years to come. They include:

- Ensuring Proper Stewardship of Recovery Act Funds
- Improving Grant Administration
- Strengthening Contract Administration
- Becoming a Model Agency for Human Capital Management
- Encouraging Ethical Conduct of Research
- Effectively Managing Large Facilities and Instruments

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

## **CHALLENGE: Ensuring Proper Stewardship of ARRA Funds**

**Overview:** The American Recovery and Reinvestment Act (ARRA), enacted in February 2009 is intended to create and save jobs through investments for long-term economic growth. ARRA provided an additional \$3 billion for the National Science Foundation (NSF) in its three core appropriations accounts: Research and Related Activities, Education and Human Resources, and Major Research Equipment and Facilities Construction (MREFC). The Act also instituted reporting requirements intended to ensure transparency and accountability. The OIG received an additional \$2 million to conduct oversight of the use of these funds.

**Challenge for the Agency:** It will be a challenge for NSF to spend its ARRA funds expeditiously while ensuring accountability and that the twin goals of reinvestment and recovery are met. We have identified a number of risk areas that represent challenges to NSF in spending ARRA funds in accordance with the law’s objectives while meeting increased reporting requirements and greater transparency. Following are examples of some of these challenges:

- Determining in advance that awards are appropriate for stimulus funding
- Making and monitoring ARRA awards, especially ones made to high-risk institutions
- Meeting the law’s requirements for greater transparency by providing all required information on the Recovery.gov website
- Promoting timely, complete, and accurate reporting by awardees

Another major challenge for NSF is the area of job creation and retention. While it is clear how NSF will meet the Act’s goal of reinvestment, it is less clear how the agency will promote the goal of economic recovery. The agency has not fully identified how NSF will address this key goal, and in particular the number of jobs created and/or retained in its ARRA-related metrics. While it is difficult to measure the economic benefits produced by basic research, stakeholders expect NSF to be able to provide information on the number of jobs created. Last spring, OIG presented NSF with an assessment of stakeholder expectations for meeting its ARRA goals.

Further, the agency’s allocation of \$200 million of ARRA funds in support of the Academic Research Infrastructure Program, a program NSF has not been involved with for some time, poses a challenge. We believe that this program presents the same types of risk to NSF as a newly established program. In addition, \$400 million of the ARRA funds are for MREFC projects. We have consistently identified these large, complex infrastructure projects as more challenging for NSF.

**OIG’s Assessment of the Agency’s Progress:** NSF has taken important steps to address the challenges posed by the increased demands of ARRA. For example, NSF quickly developed programs to make awards, established methodology and put out implementing policies and procedures that include new award terms and conditions specific to ARRA

awards. Generally, NSF is dealing well with ARRA’s funding and reporting challenges and has stated that it will focus attention on risky programs.

At the agency’s invitation, the OIG is participating in a number of teams created to grapple with issues related to ARRA implementation through which we are able to learn about the requirements associated with ARRA funds, and hear first-hand about how NSF is administering the funds. Our participation in these activities enables us to raise issues for NSF’s consideration at an early stage in the process. In those meetings and in periodic reports to the agency, we have provided NSF with our assessment of key challenges such as potentially risky programs and awardees, and the agency has been responsive to the concerns we have raised.

### **CHALLENGE: Improving Grant Administration**

**Overview:** Close monitoring and management attention from the pre-award stage through grant closeout is essential for effective grant management. The American Recovery and Reinvestment Act increases the need for effective grant management, as it will require NSF to manage an unprecedented influx of funds and resulting awards while meeting economic stimulus objectives and responding to increased reporting requirements .

An effective pre-award framework should include an assessment of financial risk to help ensure that potential awardees possess the financial capability to successfully perform under the award. Large dollar and complex awards may be more difficult to administer and may require more oversight. Pre-award financial reviews are also particularly important for new awardee institutions that may lack experience in handling government funds.

An effective post-award framework should integrate oversight of both financial and programmatic issues to ensure that awardees comply with terms, conditions, and regulations; achieve expected progress toward accomplishing project goals; and file accurate financial reports as required.

Awardees that pass through federal funds to subrecipients are required to monitor them by reviewing financial and performance reports, conducting site visits, and ensuring that subrecipients have adequate financial systems to properly manage the funds. Adequate controls over subrecipient monitoring are an important safeguard to ensure funds are spent properly.

NSF also needs to ensure that it takes action on known problems identified by OIG and Single Audits. NSF has a responsibility to follow up to correct internal control weaknesses to ensure that corrective actions are taken. Our recent review found that NSF lacks policies to do this.

**Challenge for the Agency:** Since 2002, we have recommended that NSF strengthen its post-award administration policies and practices. Over the past several years, NSF has improved its monitoring of financial performance, but refinements are needed to its

processes for: documenting site visit reviews, ensuring cost sharing requirements are met, and approving payments for grantees known for having prior problems.

A continuing challenge for the agency is to improve monitoring of program performance. This is particularly important in light of the additional awards made with ARRA funding. To integrate the monitoring of both program and administrative performance, NSF needs to improve communication between staff engaged in program and financial oversight.

Our audit work continues to document deficiencies in subrecipient oversight. Specifically, in four audits completed in March 2009 of non-profit organizations with more than \$14 million of subawards, we found a consistent pattern of inadequate subrecipient oversight. One of the four audits that focused on costs claimed by a nonprofit organization that was established to provide cooperative research and development opportunities to scientists and engineers in the independent states of the former Soviet Union found significant internal control weaknesses in the process for overseeing hundreds of foreign subrecipients. As a result, there was an increased risk of fraud and of unallowable costs being charged to the NSF awards. Without appropriate oversight of subrecipient spending, NSF risks paying substantial subaward costs absent adequate assurance that these payments are permissible.

**OIG’s Assessment of the Agency’s Progress:** NSF has reported that it has taken a number of steps during the past year to improve grants administration. For example, the agency states that it has assessed the business performance of 30 percent of awardees administering 94 percent of NSF funds through advanced monitoring, including 30 site visits and 159 desk reviews. In addition, NSF has updated its *Proposal and Award Policies and Procedures Guide* and its *Proposal and Award Manual*. The agency states that it is planning to modify: grant conditions to require principal investigators to submit a new type of final report on project outcomes; and the research.gov website to include the capability of principal investigators to report at the end of the project on project outcomes.

### **CHALLENGE: Strengthening Contract Administration**

**Overview:** NSF’s financial statement auditors recommended a number of improvements to NSF’s contract monitoring process in the management letter for the FY 2008 financial statement audit. The auditors have warned that if the problems persist, management cannot ensure the reasonableness and accuracy of costs incurred on high risk contracts, which amounted to \$205 million for FY 2008.

Effective contract administration is particularly important since NSF is in the midst of choosing a contractor to provide logistical support for the U.S. Antarctic Program over the next 13.5 years. The current contract, which is NSF’s largest valued at \$1.2 billion over 10 years, was scheduled to expire in March of 2010 but has been extended for one year.

**Challenge for the Agency:** The transition to a new USAP contract will severely test NSF’s contract administration practices. The immediate challenge is to administer an effective and successful procurement process that results in the selection of a contactor that can meet the USAP’s diverse needs while providing value to the government. The process should assure that: all offerors receive the same information and opportunities, their proposals are carefully analyzed and compared, and critical information is verified. The closeout of the existing USAP contract will also pose a challenge, as NSF must resolve issues involving the contactor’s accounting practices and subrecipient oversight that have lingered since 2000-2004, as well as obtain audits of incurred costs for later contract years. Auditors have identified specific areas needing improvement including the closeout of contracts, and reviews of incurred costs and contract expenditures.

The long-term challenge for NSF is to continue to strengthen its contract monitoring efforts once the new USAP contract is executed. In addition, in July OMB issued new guidance to strengthen and improve acquisition practices that calls on NSF and other federal agencies to achieve a number of ambitious goals. The challenges represented by the USAP contract transition, the need to correct NSF’s existing contact administration deficiencies, and meeting the heightened expectations of the administration, are formidable and will require management’s attention for years to come.

**OIG’s Assessment of Agency’s Progress:** During the past year, NSF developed and issued the Antarctic Support Contract solicitation and began evaluating proposals it received. OIG has offered advice to the agency on key areas of the cost proposals that should be verified through audits, including indirect and overhead rates and the adequacy of offerors’ business systems and cost accounting practices.

The agency has advised us that due to a delay in evaluating proposals it plans to extend the current contract for one year. But NSF needs to obtain an audit of the contractor’s disclosure statement, as well as the cost proposal for the extension, to complete the negotiations. The agency will also need audits of more recent contract costs incurred since 2004 before it can close out the contract. Meanwhile, a hiring freeze imposed by the agency earlier this year has prevented the Contracting Office from replacing departing personnel. Reductions in the number of acquisition staff during this critical period are a cause of concern and may impede NSF’s progress in surmounting these challenges.

### **CHALLENGE: Becoming a Model Agency for Human Capital Management**

**Overview:** Workforce planning and other issues such as the use of visiting scientists or “rotators”, the development of management succession plans, and delays in the process of recruiting and hiring, have long been identified by OIG as management challenges. In FY 2008, NSF increased the number of program officers by 15 percent to 520 to help alleviate workload imbalances.<sup>1</sup> But workload pressures increased significantly last February when the agency received \$3 billion in ARRA funds, the bulk of which had to be expended before fiscal year-end. The disbursement of the ARRA funds for new grants

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<sup>1</sup> According to the FY 2008 Merit Review Process Report, rotators comprise 59% of the total number of program officers.

during the last half of FY 2009 has increased workload by 40 to 50 percent for those staff engaged in processing new awards and will result in a commensurate increase in post-award workload.

In addition to these new and longstanding issues, the agency’s response to a number of workplace misconduct incidents in 2008 raised questions from Congress and others about its personnel policies and practices, as well as the effectiveness of its Equal Employment Opportunity Office. After these inquiries, the NSF Director told the National Science Board last August that he was determined to make the agency a model of workforce management within the federal government.

**Challenge for the Agency:** To become a model agency, NSF must address several deficiencies in its workforce planning process. Primarily, it must develop an effective process for estimating future workload and for determining the appropriate number and skill set of the workforce required to administer it. In the past, both program officers and administrative staff have struggled to keep pace with their grant-making responsibilities and have not had adequate time to focus on post-award monitoring activities. The additional awards funded by the Recovery Act in 2009 are likely to exacerbate the situation as they mature over the next three years and require more oversight by NSF staff.

NSF must also define an appropriate role for its temporary professional staff or “rotators” that will fully utilize their expertise in science, education, and engineering while compensating for potential weaknesses in the areas of supervision, and the lack of institutional knowledge and long-term organizational perspective. The agency should determine what types of positions should be reserved for rotators as opposed to federal employees, and if rotators are appointed as managers it must ensure that they have the skills to be effective in that role.

Finally, NSF must continue to make progress in the areas of succession planning and improving the support it offers to managers engaged in recruiting and hiring new employees. A recent analysis of NSF’s workforce indicates that 39 percent will be eligible to retire in 2011. Between the increasing number of agency managers eligible for retirement, and the rotational nature of a large segment of its program officer workforce (59%), ensuring that the appropriate planning and tools for the replenishment of NSF’s program officers and managers is critical to the agency’s success.

**OIG’s Assessment of Agency’s Progress:** The agency has taken a number of steps to improve workforce management, including hiring a permanent SES-level director of its EEO office. NSF has also formed teams of employees to identify areas for improving employee satisfaction and other areas affecting human capital. The announcement of the agency’s goal to become a model of human capital management is a positive development, indicating an increased commitment on the part of NSF toward improving its human capital management.

The agency continues to make progress towards improving workforce planning. It states that it has taken a number of steps over the past year to address workforce planning issues, including evaluating and updating the workforce planning systems, and improving its customer ratings for agency recruiting and hiring services. NSF reports that further efforts in the areas of staffing, management succession and the use of rotators are pending an upcoming comprehensive analysis of these issues early next year by OPM. Finally, in its FY 2010 budget, NSF has requested funds to contract for development of systems requirements for a workload analysis tool.<sup>2</sup>

### **CHALLENGE: Encouraging the Ethical Conduct of Research**

**Overview:** The opportunities and incentives for scientists to commit research misconduct or engage in questionable research practices have never been greater, due to the increasing amount of information stored on the internet, the development of more powerful search tools, the ubiquity of digital research data and the ease with which such data can be manipulated, and the availability of new stimulus-related research funds. In a recent survey of 2,500 scientists by the Pew Research Center, 11% of those polled indicated that the possibility of making a lot of money leads many in their specialty to violate ethical principles, while 26% reported that it leads their colleagues to cut corners on quality.<sup>3</sup>

Research collaborations between scientists and students from different nations continue to proliferate. Since there are often differences between the various science communities concerning their views on research ethics, and the reporting and compliance regime to which they are subject, it can often be unclear to individual researchers (and sometimes even their oversight officials) which set of rules applies. International organizations such as the OECD’s Global Science Forum (GSF) recognize the problem and have taken steps to foster a discussion about these issues and attempt to develop one framework that will apply in the area of research misconduct.

**Challenge for the Agency:** NSF’s challenge is to strengthen understanding and adherence to recognized standards of ethical research conduct by scientists in the U.S. and those who participate in international collaborations. One step to addressing the first part of the challenge was mandated by the America COMPETES Act (ACA), which required NSF to ensure that each institution that applies for NSF funds “describe in its grant proposal a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate students, graduate students, and postdoctoral researchers participating in the proposed research project.”<sup>4</sup>

The second part of the challenge pertains to NSF’s responsibility to help lead international efforts to implement a single framework for the investigation and resolution

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<sup>2</sup> OIG is currently conducting a review of the rotating director model, and is planning to perform an evaluation of workforce planning issues during the coming year.

<sup>3</sup> “Public Praises Science; Scientists Fault Public, Media”, Pew Research Center for the People and the Press, July 9, 2009.

<sup>4</sup> 42 U.S.C. § 1862o-1.

of research misconduct allegations made against a participant in a multinational collaboration. In 2007 and in April 2009, the Global Science Forum issued reports that provide a basis for research integrity frameworks in projects involving international partners.<sup>5</sup>

**OIG’s Assessment of Agency’s Progress:** During the past year, NSF published in the Federal Register its implementation of the ACA requirement, incorporated the requirement into its proposal certifications and updated its Award & Administration Guide and Grant Proposal Guide. It has made two awards to support beta websites that provide resources on ethics education in science and engineering awards. With regard to international collaborations, NSF states that it will complete a white paper related to the GSF report by the end of the year that will specify the actions that it intends to take.

**CHALLENGE: Effectively Managing Large Facilities and Instruments**

**Overview:** In FY 2006, NSF spent more than \$1 billion for the operations phase of 16 large facilities including the National Center for Atmospheric Research and the Network for Earthquake Engineering Simulation. The operations phase for large facilities includes the day-to-day work required to support and conduct research and education activities and to ensure that the facility is operating efficiently and in a cost-effective manner. NSF typically awards five-year cooperative agreements to universities or to non-profit organizations to operate and maintain these large facilities. Under the cooperative agreements, the awardee is responsible for day-to-day operations at the facilities, and NSF is responsible for monitoring and overseeing the awardee’s programmatic and financial performance. Cooperative agreements should contain clear performance metrics to help ensure fiscal accountability, stewardship of NSF assets, and compliance with laws and regulations.

**Challenge for the Agency:** Management of its large facilities presents several challenges for NSF. Because it lacks an overarching policy to ensure that large facility agreements contain terms and conditions to address performance evaluation and measurement, it is a challenge for NSF to make difficult funding decisions between competing priorities. Only two of the six large facility agreements reviewed by the OIG in 2008 included terms and conditions addressing the primary components of a robust program evaluation and measurement system. Given NSF’s \$1 billion annual funding for large facilities, all large facility agreements should contain performance components. Absent these components NSF cannot be assured that the facilities it funds are operating effectively and efficiently and achieving intended goals.

**OIG’s Assessment of the Agency’s Progress:** NSF agreed with our recommendations to: strengthen its cooperative agreements by adding authority and resources to NSF’s Large Facilities Office, and training NSF staff on the use of performance evaluation and measurement in connection with all large facilities. In its response to last year’s management challenges letter, NSF reported that it has issued a requirement for all

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<sup>5</sup> See <http://www.oecd.org/dataoecd/37/17/40188303.pdf> and <http://www.oecd.org/dataoecd/29/4/42713295.pdf>.

operational facilities to have performance measures established in the cooperative agreements and reported annually. The agency also reported that it conducted its second Large Facilities Workshop on Best Practices for awardees and NSF staff. Additionally, NSF stated that it revised supplementary materials to the Large Facilities Manual and conducted training on the Manual for NSF program staff. Further, NSF has increased the number of personnel assigned to the Large Facilities Office.

NATIONAL SCIENCE FOUNDATION  
4201 WILSON BOULEVARD  
ARLINGTON, VIRGINIA 22230



OFFICE OF THE  
DIRECTOR

**MEMORANDUM**

**Date:** November 2, 2009

**To:** Allison C. Lerner  
Inspector General, NSF

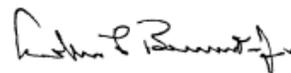
**From:** Director, NSF

**Subject:** Response to the Inspector General's Memorandum  
Management Challenges for NSF in FY 2010

Thank you for your memorandum of October 16, 2009, "Management Challenges for NSF in FY 2010." The six issue areas that are cited as presenting the most serious management and performance challenges to the agency – Ensuring Proper Stewardship of Recovery Act Funds, Improving Grant Administration, Strengthening Contract Administration, Becoming a Model Agency for Human Capital Management, Encouraging Ethical Conduct of Research, and Effectively Managing Large Facilities and Instruments – are all current priority issues for NSF management.

The agency is dealing with these issues on a continuing basis and as you aptly noted in your memorandum, these are areas that will likely require management's attention for years to come. As in past years, your memorandum will be shared and discussed with the Foundation's executive staff and officers in the Senior Management Round Table (SMaRT).

The attached report highlights some of the significant actions that were undertaken by the agency last year on the FY 2009 management challenges. As we continue efforts to operate more efficiently and effectively, your memorandum will help guide future activities and resource management decisions.

  
Arden L. Bement, Jr.

Attachment

cc: Chair, National Science Board  
Chair, National Science Board Audit and Oversight Committee

**NATIONAL SCIENCE FOUNDATION (NSF)  
Progress During Fiscal Year (FY) 2009  
On the OIG's FY 2009 Management Challenges**

<b>OIG's FY 2009 Management Challenge</b>	<b>NSF's Significant Actions Taken in FY 2009</b>	<b>NSF's Anticipated Next Steps</b>
<b>Award and Contract Administration</b>		
<p><i>a. Post-Award Administration Policies</i></p>	<ul style="list-style-type: none"> <li>• Assessed business performance of 30 percent of awardees administering 94 percent of NSF funds through advanced monitoring (30 site visits, 159 desk reviews) under the Award Monitoring and Business Assistance Program (AMBAP)</li> <li>• Issued an updated <i>Proposal &amp; Award Policies &amp; Procedures Guide</i> that incorporated revisions related to the America COMPETES Act (ACA); updated NSF <i>Proposal and Award Manual</i></li> <li>• Initiated planning for public-facing project report on outcomes of NSF-funded awards (per ACA), highlighting project results and other award products</li> <li>• Developed “Division Director (DD)-concur” functionality in e-Jacket based on end-user input</li> <li>• Provided technical support to second NSB report, <i>Investing in the Future: NSF Cost Sharing Policies for a Robust Federal Research Enterprise (August 3, 2009)</i></li> <li>• Implemented Information Technology (IT) System hard edit to prohibit award close-out without grantee final cost share certification and Program Officer acceptance</li> <li>• Held Effective Practices Forum topic-specific meetings, at least quarterly, for the NSF Center programs to share management and other practices</li> </ul>	<ul style="list-style-type: none"> <li>• Work with ARRA Steering Committee on updating ARRA policies and procedures document. Revised policies and procedures will address: (1) transfers of ARRA awards, and (2) quarterly recipient reporting requirements. Updated document will identify resources for use by staff in responding to questions from the recipient community, as well as a description of the automated data quality review process that NSF will conduct and Program Officer involvement in the quarterly manual sampling of reports that will be coordinated by the Office of Budget, Finance, and Award Management.</li> <li>• Update proposal and award manuals to reflect changes in policies and procedures</li> <li>• Modify NSF Grant Conditions to require Principal Investigators (PIs) to submit a new type of final report on project outcomes</li> <li>• Modify Research.gov web site to include the capability for PIs to report on end-of-project outcomes</li> <li>• Implement beta DD-concur functionality in e-Jacket</li> <li>• Create automatic notification to awardees for final cost share certification</li> </ul>

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<b>Award and Contract Administration - continued</b>		
<i>b. Contract Administration</i>	<ul style="list-style-type: none"> <li>• Developed the U.S. Antarctic Program (USAP) Antarctic Support Contract solicitation and received proposals</li> <li>• Convened the Source Selection Evaluation Team; proposals are being evaluated</li> <li>• Drafted a contract closeout guide</li> <li>• Modified Contracting Officer Technical Representative Handbook training</li> </ul>	<ul style="list-style-type: none"> <li>• Continue the evaluation process until a decision is reached for contract award</li> <li>• Complete closeout guide and ensure proper review and approval of the policy guidance</li> </ul>
<i>c. Management of Large Infrastructure Projects</i>	<ul style="list-style-type: none"> <li>• Increased Large Facilities Office staff to strengthen NSF's operational oversight of large facilities</li> <li>• Strengthened oversight by directorates in several ways; for example: (1) revised supplementary materials to the Large Facilities Manual and conducted training on the Manual for NSF program staff; (2) conducted second annual Large Facilities Workshop on Best Practices for awardees and NSF staff; and (3) issued requirement for all operational facilities to have performance measures established in the Cooperative Agreements and reported annually to NSF.</li> <li>• Revised Business Systems Review (BSR) Guide consistent with direction of the BSR Subcommittee of the Business and Operations Advisory Committee</li> <li>• Conducted three BSRs</li> </ul>	<ul style="list-style-type: none"> <li>• Release supplementary materials to Large Facilities Manual for public access</li> <li>• Conduct third annual Large Facilities Workshop on Best Practices for awardees and NSF staff in Spring 2010</li> <li>• Conduct Project Science Workshop on preconstruction planning for new and ongoing funded project and NSF staff</li> </ul>

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<b>Award and Contract Administration - continued</b>		
<b>d. Audit Resolution</b>	<ul style="list-style-type: none"> <li>• Resolved 367 audits (as of FY 2009 end), 75 percent within six months of their receipt from the NSF OIG</li> <li>• Provided OIG access to information for its <i>Audit of the Audit Resolution Process</i> (initiated in March 2008); met with auditors on the process; discussed preliminary findings with the audit team; responded to detailed responses to follow-up questions regarding audit resolution policies and procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Develop agency response to the OIG draft report, <i>Audit of NSF's Audit Resolution Process for OIG Audits of NSF Awardees</i></li> <li>• Continue to work with OIG auditors providing any further documentation and/or information needed for their review</li> <li>• Respond to findings and recommendations of the final report, <i>Audit of NSF's Audit Resolution Process for OIG Audits of NSF Awardees</i>, for NSF Senior Management</li> </ul>
<b>e. International Awards</b>	<ul style="list-style-type: none"> <li>• Developing a white paper in response to a report of the Organization for Economic Co-operation and Development (OECD) Global Science Forum Coordinating Committee for Facilitating International Research Misconduct Investigations</li> <li>• Participated in the International Workshop on Accountability Challenges in Lisbon, Portugal</li> <li>• Referenced OECD materials on research misconduct in program solicitation (NSF 09-566) for the new Basic Research to Enable Agricultural Development (BREAD) program which anticipates subawards to foreign institutions</li> <li>• Proposed language about international considerations for inclusion in materials being developed in response to Section 7009 of the ACA concerning responsible and ethical conduct of research</li> <li>• Compiling a summary of NSF Policies and Practices for International Engagements that will be used to educate and give guidance to NSF staff</li> </ul>	<ul style="list-style-type: none"> <li>• Complete white paper related to OECD report and share information with the National Science Board</li> <li>• Monitor new program solicitations to ensure appropriate language regarding international activities</li> <li>• Finalize internal summary of NSF Policies and Practices for International Engagements, and ensure that policies are appropriately reflected in official NSF documents</li> <li>• Conduct in-reach and outreach regarding international aspects of accountability and research integrity</li> </ul>

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<b>Award and Contract Administration - continued</b>		
<p><i>f. Ethical Conduct of Research</i></p>	<ul style="list-style-type: none"> <li>• Posted on the National Academy of Engineering Ethics and Society website the report from the NSF-funded workshop, <i>Ethics Education: What's Been Learned, What Should Be Done?</i> held by the National Academies of Science</li> <li>• Posted Federal Register Notice (#74 FR 8818) including NSF's proposed implementation plan for Section 7009 of ACA concerning responsible and ethical conduct of research; resolved 188 comments received prior to finalizing the Foundation's RCR implementation strategy</li> <li>• Posted Federal Register Notice (#74 FR 42126) which announced NSF's implementation strategy for Section 7009 of the ACA; the FR notice specified that NSF's formal implementation would appear in an updated version of the <i>NSF Proposal &amp; Award Policies &amp; Procedures Guide</i></li> <li>• Issued an Updated Version of the <i>NSF Proposal &amp; Award Policies &amp; Procedures Guide</i> which specified NSF's formal RCR implementation in Part I: <i>Grant Proposal Guide</i> as a new proposal certification, as well as in Part II, <i>Award &amp; Administration Guide</i> which addressed awardees post award requirements</li> <li>• Made two awards to support development of beta sites that provide resources on ethics education in science and engineering awards</li> <li>• Continued funding research in ethics education and promoted development and implementation of effective practices through education and training programs</li> </ul>	<ul style="list-style-type: none"> <li>• Update NSF's award terms and conditions to incorporate the requirement that the institution verify that all undergraduates, graduate students and postdoctoral researchers supported by NSF have received the requisite training</li> <li>• Issue a set of FAQs to address the questions received from the university community in response to NSF's implementation of Section 7009</li> </ul>

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<b>Human Capital (HC)</b>		
<i>a. Workforce Planning</i>	<ul style="list-style-type: none"> <li>• Completed staffing plans for FY 2009 - 2010</li> <li>• Created Administrative Functions Management (AFM) position summary and competency profiles; created Learning Maps within the Academy Learn system for all five AFM jobs</li> <li>• Evaluated existing workforce planning systems and identified systems requirements</li> <li>• Updated workload analysis model forecast for FYs 2009 – 2011</li> <li>• Piloting a New Executive Transition website</li> <li>• Piloted a Knowledge Management portal</li> <li>• Developing the content for a comprehensive program management curriculum</li> <li>• Developed a list of Program Officer related e-Business courses on Review Analysis and Finding Reviewers</li> <li>• Achieved a 4.7 to 10.5 percent improvement in workforce planning, performance management, recruitment of permanent, executive and rotator staff, and organizational development activities as indicated by the annual customer satisfaction survey</li> </ul>	<ul style="list-style-type: none"> <li>• Further efforts in the areas of staffing, management succession and the use of “rotators” which will be guided by the results of an upcoming comprehensive analysis of these human capital issues</li> <li>• Develop content for New Executive Transition website</li> <li>• Continue vetting e-Business courses</li> <li>• Explore other alternatives for knowledge management retention for departing and replacing executives (based on feedback from the pilot)</li> <li>• Roll out new briefing for all new employees about working at NSF and for the Federal Government</li> </ul>

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<b>Human Capital (HC) - continued</b>		
<b><i>b. Administrative Infrastructure</i></b>	<ul style="list-style-type: none"> <li>• Initiated a user interface working group in collaboration with EDS to identify areas for improvement</li> <li>• Implemented an aggressive customer care program</li> <li>• Increased the number of FedTraveler/EDS helpdesk staff to enhance customer service</li> <li>• Achieved 9 percent improvement in customer service and 40 percent improvement in the FedTraveler system as indicated by the annual customer satisfaction survey</li> <li>• Started a process to identify improved ways to allocate travel funds for oversight; distribution of travel funds for oversight has been a focus of the Deputy Directors/ Executive Officers (DADEO) work group; the level of funding would be to the extent AOAM budget permits.</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in GSA's "next generation e-travel effort" in preparation for the expiration of the current e-travel system contracts, including FedTraveler</li> <li>• Augment travel staffing</li> </ul>
<b>Budget, Cost and Performance Integration</b>		
<b><i>a. Performance Reporting</i></b>	<ul style="list-style-type: none"> <li>• Clarified the evaluation criteria under each of the strategic outcome goals (<i>Discovery, Learning, and Research Infrastructure</i>) in preparation for the June 2009 meeting of the Advisory Committee for GPRA Performance Assessment (AC/GPA) which resulted in the Committee conducting a more thorough evaluation of the outcomes and examining other ways to evaluate program outcomes over a longer period</li> </ul>	<ul style="list-style-type: none"> <li>• Review the Committee's recommendations on how NSF may continue to take a longer-term view of program assessment</li> </ul>
<b><i>b. Cost Information</i></b>	<ul style="list-style-type: none"> <li>• Enhanced the effort begun in the FY 2009 Budget Request related to NSF's investments in IT to support its programs and operations</li> <li>• Presented the detailed allocation for IT in NSF's annual budget request to the Congress</li> <li>• Provided information on IT investments that support administrative functions and NSF's programmatic</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to explore additional approaches to make cost information related to NSF's internal operations more transparent and accessible in ways that avoid placing an additional recordkeeping burden on staff</li> </ul>

**NATIONAL SCIENCE FOUNDATION (NSF)  
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	investments	
<b>OIG's FY 2009 Management Challenge</b>	<b>NSF's Significant Actions Taken in FY 2009</b>	<b>NSF's Anticipated Next Steps</b>
<b>United States Antarctic Program (USAP)</b>		
<i>a. Long-Term Planning</i>	<ul style="list-style-type: none"> <li>• Provided a detailed explanation to the OIG on the mechanisms that are used to ensure the plant, property and equipment is maintained, upgraded and replaced, as may be appropriate on a case-by-case basis</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to place a high priority on the health and safety, occupational as well as medical, of all participants in the USAP and to seek ways to improve the delivery of services to accomplish this goal</li> </ul>
<i>b. Disaster Recovery Planning</i>	<ul style="list-style-type: none"> <li>• Resolved this issue with the OIG in 2007, and planning has been completed</li> </ul>	<ul style="list-style-type: none"> <li>• Complete implementation by the new contractor for the USAP</li> <li>• Continue to maintain the USAP network and its operations with regard for security and continuity of operations</li> </ul>
<b>Merit Review</b>		
<i>Broadening Participation in the Merit Review Process</i>	<ul style="list-style-type: none"> <li>• Finalized and published the Framework for Action, incorporating Advisory Committee comments</li> <li>• Established internal and external web pages for Broadening Participation</li> <li>• Published and updated Broadening Participation Portfolio</li> <li>• Held workshop for tribal colleges and universities and other grants workshops for diverse institutions</li> <li>• Refined plan for Reviewer Services, integrating with other research.gov services to broaden participation</li> <li>• Began implicit bias training module for program officers</li> </ul>	<ul style="list-style-type: none"> <li>• Pilot Reviewer Services</li> <li>• Pilot implicit bias training and make it available for all program officers</li> <li>• Distribute OMB-approved reviewer questionnaire and measure merit review participation results</li> </ul>

## **PATENTS AND INVENTIONS RESULTING FROM NSF SUPPORT**

The following information about inventions is being reported in compliance with Section 3(f) of the National Science Foundation Act of 1950, as amended [42 U.S.C. 1862(f)]. There were 1,449 NSF invention disclosures reported to the Foundation either directly or through NIH's iEdison database during FY 2009. Rights to these inventions were allocated in accordance with Chapter 18 of Title 35 of the United States Code, commonly called the "Bayh-Dole Act."

## ACRONYMS

AC	Advisory Committee	ICASS	International Congress of Arctic Social Sciences
ACA	America Competes Act	ICWG	Ice Core Working Group
AFR	Annual Financial Report	IPIA	Improper Payments Information Act of 2002
AMBAP	Award Monitoring and Business Assistance Program	IT	Information Technology
AOAM	Agency	LIGO	Laser Interferometer Gravitational Wave Observatory
APIC	Accountability and Performance Integration Council	MOU	Memorandum of Understanding
APR	Annual Performance Report	MREFC	Major Research Equipment and Facilities Construction
ARI	Academic Research Infrastructure	MSP	Math and Science Partnership
ARRA	American Recovery and Reinvestment Act of 2009	MTS	Federal Measurement Tracking System
BREAD	Basic Research to Enable Agricultural Development	NIST	National Institute of Standards and Technology
BSR	Business Systems Review	NSB	National Science Board
CFO	Chief Financial Officer	NSF	National Science Foundation
CMIA	Cash Management Improvement Act	OECD	Organisation for Economic Co-operation and Development
COO	Chief Operating Officer	OIG	Office of Inspector General
COV	Committee of Visitors	OMB	Office of Management and Budget
CSEMS	Computer Science, Engineering and Mathematics Scholarship Program	OPM	United States Office of Personnel Management
CSRS	Civil Service Retirement System	OPP	Office of Polar Programs
DD	Division Director	PP&E	Property, Plant and Equipment
DOL	Department of Labor	R&RA	Research and Related Activities
EEO	Equal Employment Opportunity	RCR	Responsible Conduct of Research
EHR	Education and Human Resources	RPSC	Raytheon Polar Services Company
EIS	Enterprise Information System	SBR	Statement of Budgetary Resources
FAS	Financial Accounting System	SES	Senior Executive Service
FASAB	Federal Accounting Standards Advisory Board	SFFAS	Statements of Federal Financial Accounting Standards
FBWT	Fund Balance with Treasury	STEM	Science, Technology, Engineering, and Mathematics
FCTR	Federal Cash Transaction Report	TAFS	Treasury appropriation fund symbol
FECA	Federal Employees' Compensation Act	TBD	To Be Determined
FERS	Federal Employees Retirement System	UNAVCO	University NAVSTAR Consortium
FFMIA	Federal Financial Management Improvement Act of 1996	USAF	U.S. Air Force
FFR	Federal Financial Report	USAP	U.S. Antarctic Program
FMFIA	Federal Managers' Financial Integrity Act of 1982		
FFRDC	Federally Funded Research and Development Center		
FISMA	Federal Information Security Management Act		
FMFIA	Federal Financial Management Improvement Act of 1996		
FSIO	Financial Systems Integration Office		
FY	Fiscal Year		
GAAP	Generally Accepted Accounting Principles		
GPA	GPRA Performance Assessment		
GPRA	Government Performance and Results Act		
GSA	Government Services Administration		
HC	Human Capital		