

A large, stylized gear graphic in shades of blue and teal. The letters 'INSE' are prominently displayed in a serif font across the center of the gear. The background is a solid teal color.

INSE

Chapter 3

Appendices

Summary of FY 2015 Financial Statement Audit and Management Assurances

Table 1. Summary of Financial Statement Audit

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

Table 2. Summary of Management Assurances

Effectiveness of Internal Control over Financial Reporting (FMFIA § 2)					
Statement of Assurance	<i>Unqualified</i>				
	Beginning Balance	New	Resolved	Consolidated	Ending Balance
<i>Total Material Weaknesses</i>	0	-	-	-	0
Effectiveness of Internal Control over Operations (FMFIA § 2)					
Statement of Assurance	<i>Unqualified</i>				
	Beginning Balance	New	Resolved	Consolidated	Ending Balance
<i>Total Material Weaknesses</i>	0	-	-	-	0
Conformance with Financial Management System Requirements (FMFIA § 4)					
Statement of Assurance	<i>Systems conform to financial management system requirements</i>				
	Beginning Balance	New	Resolved	Consolidated	Ending Balance
<i>Total Non-Conformances</i>	0	-	-	-	0
Compliance with Section 803(a) of the Federal Financial Management Improvement Act (FFMIA)					
	Agency		Auditor		
1. System Requirements	<i>No lack of substantial compliance noted</i>				
2. Accounting Standards	<i>No lack of substantial compliance noted</i>				
3. U.S. Standard General Ledger at Transaction level	<i>No lack of substantial compliance noted</i>				

National Science Foundation

FY 2015 Improper Payments Elimination and Recovery Act (IPERA) Reporting Details

The Improper Payments Information Act of 2002 (IPIA; Pub. L. 107-300), as amended by the Improper Payments Elimination and Recovery Act of 2010 (IPERA; Pub. L. 111-204), and the Improper Payments Elimination and Recovery Improvement Act of 2012 (IPERIA; Pub. L. 112-248), require agencies to annually report information on improper payments to the President and Congress through their annual Performance Accountability Reports (PARs) or AFRs.

I. Risk Assessment

NSF reached an agreement with the Office of the Inspector General (OIG) to do a qualitative risk assessment of improper payments for FY 2015. Additionally, NSF has updated its 2013-2014 IPERA risk assessment report and completed follow-up activities for cooperative support agreements and graduate research fellowship grants.

NSF completed an IPERA risk assessment during FY 2014. The FY 2013-2014 risk assessment covered grants, contracts, and payroll payments. The risk assessment followed OMB criteria as contained in Appendix C, *Management's Responsibility for Internal Control* of OMB Circular No. A-123 and employed both a qualitative and quantitative approach in determining NSF's level of susceptibility to improper payments. It also considered NSF's financial processing and internal controls, monitoring and assessment, human capital, operations and management, volume of payments, and materiality. The risk assessment did not indicate significant susceptibility to improper payments for NSF grants, contracts or payroll payments.

During June 2015, the OIG audit contractor completed an audit of NSF's compliance with IPERA. The audit objective was to review the improper payment reporting in NSF's FY 2014 Agency Financial Report (AFR), and accompanying materials, to determine whether the agency met the OMB criteria for compliance with IPERA (Public Law 111-204). The auditors found that NSF did not comply with the IPERA reporting requirements in the FY 2014 AFR.

In order to address the audit findings, NSF reached consensus with the NSF-OIG on how to move forward to address the results of the audit report. As noted above, NSF is in the process of completing a qualitative risk assessment of improper payments for FY 2015. Additionally, NSF updated its FY 2013-2014 risk assessment report to include the 9 risk factors and completed financial award monitoring testing of its fellowship and cooperative agreement award instruments. The financial monitoring testing was an outcome of the FY 2013-2014 risk assessment, which identified fellowship and cooperative support agreement award instruments as grant program activities for further review. NSF included the results for the financial award monitoring testing in its 2015 update of the risk assessment report, which will also consider the 9 risk factors contained in OMB Circular A-123 Appendix C. The testing found a very low rate of unallowable costs for fellowships and cooperative support agreements. It was significantly below the criteria for a significant risk of improper payments as contained in Appendix C, *Management's Responsibility for Internal Control* of OMB Circular No. A-123. The testing report was included as supplemental information for the updated risk assessment.

II. Statistical Sampling

Not applicable.

III. Improper Payment Reporting

Not applicable.

a. Not applicable.

b. Not applicable.

c. Not applicable.

Table 1

Improper Payment Reduction Outlook

Not applicable.

d. Not applicable.

e. Not applicable.

f. High-Priority Programs

Not applicable.

IV. Improper Payment Root Cause Categories

Not applicable.

Table 2

Improper Payment Root Cause Category Matrix

Not applicable.

V. Corrective Actions

Not applicable.

a. High-Priority Programs

Not applicable.

VI. Internal Control Over Payments

Not applicable.

Table 3

Example of the Status of Internal Controls

Not applicable.

VII. Accountability

Not applicable.

VIII. Agency Information Systems and Other Infrastructure

Not applicable.

IX. Barriers

Not applicable.

X. Agency Recapture of Improper Payments Reporting

a. Payment Recapture Audits Narrative

NSF did not conduct payment recapture audits during FY 2015. In September 2015, NSF notified OMB that it would not be cost effective for the agency to conduct a recapture audit program.

b. Programs Excluded from the Payment Recapture Audit Program

NSF determined that it would not be cost effective to conduct recapture audits of its single grants program and other activities (i.e., contracts, travel, purchase cards, and payroll). In accordance with Circular A-123 “Management’s Responsibilities for Internal Controls,” on September 28, 2015, NSF notified OMB and its Inspector General of this decision and included supporting analysis. The results of grant testing, audits, internal control reviews, and monitoring programs have consistently demonstrated that there is no significant risk of unallowable costs/improper payments within NSF’s single grant program and other activities. The analysis used to determine that a payment recapture audit program was not cost effective leveraged the work performed under the Improper Payments Elimination and Recovery Act (IPERA), the Single Audit Act, and the Uniform Grant Guidance. NSF also considered cost incurred audits of its high risk contracts and cost incurred audits of the agency’s cooperative agreements.

The 2013-2014 IPERA risk assessment which used quantitative and qualitative factors to assess NSF’s singular grant program and other activities did not indicate susceptibility to a high risk of improper payments. This was consistent with the agency’s history of low improper payments. NSF tested grant payments as part of its 2013-2014 risk assessment and the FY 2015 payment testing for fellowship and cooperative support agreement award instruments. The results from two years of testing on over 1,500 expense entries identified under \$50,000 in unallowable costs. The FY 2014 payment testing found that the error rate for grant expenses was considerably below the significant improper payment criteria of 1.5 percent of program outlays and \$10 million of all program activity payments. NSF will complete a qualitative risk assessment of improper payments for FY 2015.

In FY 2015, the NSF OIG issued audits and reviews that had questioned costs of \$5,438,611. These questioned costs were limited to four grantee institutions. In the case of audits of grantees for which NSF is the cognizant agency, questioned costs totaled \$17,362. Total recoveries to date related to audit resolution and disallowed expenses are \$239,152. This includes \$140,000 recovered through a long term repayment plan related to one grantee institution.

NSF has invested significant resources in its grant monitoring program. As a key component of the agency's grant monitoring program NSF completes advanced monitoring activities, which include desk reviews, site visits, and Business Systems Reviews of NSF's large facilities construction and operation. These provide reasonable assurance to the agency that grant recipient institutions managing higher-risk awards possess adequate policies, processes, and systems to properly manage federal awards.

NSF reviewed the susceptibility of contract payments to significant improper payments as part of its 2013-2014 risk assessment and deemed them low risk. Of the \$600 million in payments, under \$518 million went to non-governmental entities, making them within the scope of IPERA regulations, as amended. Of the less than \$518 million in scope, over 41% was paid to NSF's two largest contractors in support of its Arctic and Antarctic operations. While payments to these contractors totaled almost \$216 million of the \$518 million in contracts payments, they only made up 0.4% of the recorded payment transactions for FY 2013. The NSF Internal Controls Program also performs an annual review of the agency's procure-to-pay process. The procure-to-pay review followed payments from invoice receipt through Contracting Officer Representative approval to verify that the payment was made in agreement with contractual requirements and examined the design, operating efficiency and effectiveness of several key controls throughout the process.

NSF uses the Department of the Interior, Interior Business Center (IBC) as a Shared Service Provider to perform many of its payroll functions. The IBC's internal control over its shared service offering is audited annually under the Statement on Standards for Attestation Engagements No. 16, Reporting on Controls at a Service Organization. In FY 2015, the IBC's controls were found to be suitably designed and operating effectively.

c. Payment Recapture Audit Reporting

NSF did not conduct payment recapture audits during FY 2015.

d. Overpayments Recaptured Outside of Payment Recapture Audits

NSF collected remittances outside of payment recapture audits related to the following: payment reviews or audits; OIG reviews; Single Audit reports; and self-reported overpayments. These are reflected in Table 4 "Overpayments Recaptured Outside of Payment Recapture Audits."

e. Payment Recapture Audit Program Targets

Not Applicable.

Table 4
**Improper Payment Recaptures with and without Audit Programs
(\$ in Millions)**

Overpayments Recaptured outside of Payment Recapture Audits		
Program or Activity	Amount Identified	Amount Recaptured
Grants	\$8.472	\$6.867
Contracts	\$0.061	\$0.061
Travel	\$0.019	\$0.019
Purchase Cards	\$0.000	\$0.000
Payroll and Other	\$0.033	\$0.033
<i>TOTAL</i>	\$8.585	\$6.980

f. Not Applicable.

1. Not applicable.

Table 5
Disposition of Funds Recaptured through Payment Recapture Audits

Not applicable.

2. Not applicable.

Table 6
Aging of Outstanding Overpayments Identified in the Payment Recapture Audits

Not applicable

XI. Additional Comments

Not applicable.

XII. Agency Reduction of Improper Payments with the Do Not Pay Initiative

NSF has been actively participating in OMB’s Do Not Pay (DNP) initiative to reduce improper payments through the implementation of pre-award and post-payment activities. For pre-award activities, the agency has incorporated the DNP solution into its pre-award review process for all grants and cooperative

Appendix 2: Improper Payments Elimination and Recovery Act Reporting

agreements. The DNP solution complements NSF’s existing policies and procedures for award management. The agency has integrated the functionality into its award management process. NSF has also automated the reviews and centralized the pre-award verification. This has created efficiency gains by reducing the workload for manual verification.

NSF uses the Department of Treasury to disburse all funds. NSF payments are compliant with the Treasury’s Payment Application Modernization format and are screened against the following data sources: Death Master File (DMF)-Public and the System for Award Management (SAM) Exclusion Records-Restricted. Any subsequent matches are viewable in the Treasury Do Not Pay Portal for adjudication purposes. No additional data sources are available in the Treasury payment integration process at this time. In FY 2015, 49,000 payments for over \$6 billion were screened through the Treasury Do Not pay process (Table 7). NSF had no positive matches for DMF and SAM.

Implementation of the Treasury’s Payment Application Modernization screening process has reduced the number of false positives from over 550 during fiscal year 2014 to zero in fiscal year 2015. This has produced resource savings for the agency from not having to manually research each false positive using the Do Not Pay online portal.

Table 7
Results of the Do Not Pay Initiative in Preventing Improper Payments
 (\$ in Millions)

	Number of Payments Reviewed for Possible Improper Payments	Dollars of Payments Reviewed for Possible Improper Payments	Number of Payments Stopped	Dollars of Payments Stopped	Number of Potential Improper Payments Reviewed and Determined Accurate	Dollars of Potential Improper Payments Reviewed and Determined Accurate
Reviews with the IPERIA specified databases	51,960	\$6,601.40	0	0	0	\$0
Reviews with databases not listed in IPERIA	N/A	N/A	N/A	N/A	N/A	N/A

DMF: Social Security Death Master File
 SAM: GSA System for Award Management



National Science Foundation • Office of Inspector General
4201 Wilson Boulevard, Suite I-1135, Arlington, Virginia 22230

October 15, 2015

MEMORANDUM

To: Dr. Dan E. Arvizu
Chair, National Science Board

Dr. France Cordova
Director, National Science Foundation

From: Allison Lerner
Inspector General, National Science Foundation

Subject: Management Challenges for NSF in FY 2016

In accordance with the Reports Consolidation Act of 2000, I am submitting our annual statement summarizing what the Office of Inspector General 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 evaluative reports of others, including the Government Accountability Office and NSF's various advisory committees, contractors, and staff.

We have focused on seven issue areas that reflect fundamental program risk and are likely to require management's attention for years to come. They are:

- Establishing Accountability over Large Cooperative Agreements
- Managing of NSF's Business Operations
- Managing of the IPA Program
- Moving NSF Headquarters to a New Building
- Managing the U.S. Antarctic Program
- Improving Grant Administration
- Encouraging the Ethical Conduct of Research

As you can see, we lead with a challenge focused on large cooperative agreements. While the agency has agreed to take some actions to enhance accountability over such agreements, we believe that significant risks remain. Our September 2015 alert memo on NSF's management of the potential \$80 million cost overrun for NEON outlined factors that contributed to the overrun, including that fact that NSF did not increase its monitoring of expenditures in the wake of significant problems with the project's cost proposal.

We have broadened the previous challenge on managing programs and resources in times of budget austerity to include the significant challenges faced by the "business" side of NSF, such

as finding and eliminating improper payments, protecting agency information and IT resources, and managing the government's records. Selecting and producing great science is the agency's most important job, but with an annual appropriation of over \$7 billion and a diverse portfolio of projects to manage, NSF leadership cannot overlook the importance of its administrative operations. Effective business executives and administrators are as critical to NSF's success as are its scientists.

Finally, we have added a challenge on NSF's management of the IPA program. While there are benefits that come from having IPAs at NSF, there are also less positive aspects such as higher costs and frequent turnover in leadership positions. In addition, since IPAs make funding decisions while at the Foundation, it critical that strong controls be in place to identify and mitigate conflicts of interest that occur as a result of rotators' research activities and connections with their home institution.

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

Sincerely,



Allison C. Lerner

CHALLENGE: Establishing Accountability over Large Cooperative Agreements

Overview: For the past four years we have directed significant attention to proposed construction budgets for NSF's recent high-risk, high-dollar cooperative agreements for large construction projects. We found that NSF approved proposed budgets for four major projects, totaling more than \$1.4 billion although significant questions existed as to the adequacy of the proposed budgets. As a result, while NSF knows what it will spend on these projects, it is not clear whether it knows what they should cost.

After four years of audit effort, the OIG escalated the recommendation for NSF to require current cost estimates for its large projects, in addition to our other recommendations-- to remove unallowable contingency from budget; require annual incurred cost submissions and audits; track contingency expenditures; and strengthen cost surveillance over large cooperative agreements. Escalation of recommendations is the final step available to the OIG in an attempt to urge NSF to strengthen accountability and to exercise proper stewardship of federal funds. NSF did not agree completely with any of the recommendations, but has stated that it will revise certain policies to address some of them.

Challenge for the Agency: It is an ongoing challenge for NSF to establish accountability for the billions of federal funds in its large cooperative agreements at the pre- and post-award stages and throughout the lifecycle of the projects.

Accountability begins at the pre-award stage and should include audits of awardees' proposed budgets and accounting systems to ensure that awardees' cost estimates are fair and reasonable and that the accounting system is adequate to bill the government properly. The Large Synoptic Survey Telescope (LSST) project was the first construction project NSF considered since our 2012 alert memo on the agency's management of its high-risk, high-dollar cooperative agreements.

We found that NSF's internal review of the cost of the LSST project could not independently verify costs for any of the 136 proposed expenditures sampled, including approximately \$145 million in direct materials, nearly \$20 million for contingencies and more than \$6 million in direct labor costs. Nonetheless, NSF moved forward with this project although it has limited insight into the makeup of the project's cost and little if any, assurance that they are reasonable.

NSF also moved forward with the \$433.8 million National Ecological Observatory Network (NEON) project. NEON project risks originated with the construction budget, which included \$154 million (nearly 36 percent of the total proposed budget) in questioned and unsupported costs, as identified by OIG audits. Auditors issued three inadequacy memos over a four month period in 2011 and issued an adverse opinion on the proposed budget in 2012 because the proposal did not form an acceptable basis for negotiation of a fair and reasonable price. As the project has progressed, additional serious financial management problems have surfaced. For example:

- An August 2015 independent, external assessment commissioned by NSF of NEON's cost estimate to complete the project gave the estimate an overall rating of "inadequate."
- In 2013, during the indirect cost rate negotiation of fiscal year 2011, NSF found potential questionable spending by NEON for meals, visa, and entertainment activities, among other things. In the same year, the indirect cost rate negotiation of fiscal year 2012 disclosed the potential of lobbying activities.
- The NEON construction award requires NSF approval before using contingency funds; however, NEON has been executing against a revised project plan that incorporated \$35 million of budget contingency into the performance measurement baseline without prior NSF approval. To date, NSF has not determined whether NEON actually spent any of the \$35 million in contingency. If, as OIG recommended, NSF held contingency funds until NEON provided sufficient support for their use, the NSF would have greater visibility over contingency expenditures and assurance that the funds were not spent in advance of NSF approval.

In June 2015, NEON management notified NSF that the project was facing a potential cost overrun of \$80 million. It is noteworthy, that NSF was originally informed by NEON that the cost overrun would be \$27 million. In response to questions from NSF, NEON increased that estimate to \$40 million, then to \$60 million and finally to \$80 million.

In light of the concerns about the NEON cost proposal, NSF should have increased its oversight of costs as the project progressed. Instead, once the project was underway NSF did not require adequate evidence that project expenditures were warranted, reasonable, or allowable under NSF and federal requirements.

NSF did not start requiring NEON to provide more detail about its spending until May 2015, and NSF has just recently started reviewing transaction level detail associated with expenditures that appeared unusual. Obtaining and reviewing transaction level data throughout the life of the project could have revealed unallowable or unreasonable expenditures, or funds spent for awards other than those for which they were provided. Incurred cost submissions and visibility over expenditures, including contingency spending, as OIG has recommended, are critical.

If NSF had strong cost surveillance practices in place from the start of the NEON project, it would have had the information it needed to identify the potential cost overruns early on, and would have been able to address them before they amounted to tens of millions of dollars. We will continue to urge the Foundation to exercise the highest level of attention and scrutiny to the financial management of its large facility projects.

OIG's Assessment of the Agency's Progress: In response to our recommendations on LSST, NSF stated that it would review the project's risk management process, including a detailed contingency review. NSF stated that it agreed with the "spirit" of our recommendations on NEON and that it is conducting monthly expenditure reviews and increasing its involvement in

management of the NEON project. NSF also stated that it plans to contract for an independent assessment of the December 2015 cost estimate to complete the project.

With respect to its large cooperative agreements, NSF has said that it will require annual incurred cost information that can be used to conduct an audit and that it will conduct incurred cost audits for projects valued at \$100 million or more at project completion and possibly at other points during the project, based on its own assessment of risk. Finally, NSF has contracted for an external, independent evaluation of its policies and procedures for large facility projects. That evaluation is expected to be available in December 2015.

As described above, NSF has stated that it intends to take some actions to strengthen accountability over its large cooperative agreements. However, in most instances, these proposed actions are forward looking, and we have not been able to verify whether they have been implemented and are working. Therefore, we remain concerned about NSF's progress toward improving cost surveillance for its largest cooperative agreements.

CHALLENGE: Management of NSF's Business Operations

Overview: NSF is a small agency in terms of staff, but one with a significant appropriation and an important portfolio of responsibilities. Its mission is to promote the progress of science primarily by making productive investments in research and the nation's science infrastructure. Consequently, most of NSF's managers and staff are successful science or engineering professionals highly qualified to help determine the composition of the agency's investments.

Selecting and producing great science is the agency's most important job, but with an annual appropriation of over \$7 billion and a diverse portfolio of projects to manage, NSF leadership cannot overlook the importance of its administrative operations. Effective executives and administrators are as critical to NSF's success as are its scientists. The "business" side of NSF faces a set of challenges aimed at improving the organizations' management controls over payments, information security, recordkeeping, and reporting. Simply stated, NSF will be challenged to "multitask" and deliver both scientific and organizational excellence.

Challenge for the Agency:

Finding and Eliminating Improper Payments

Ensuring that payments are proper at the time they're initiated has always been challenging for NSF because grant recipients are generally not required to present supporting documentation, such as invoices and receipts, in order to receive payments from the agency. As a result, NSF issues approximately \$6 billion annually in grant and cooperative agreement payments without verification, relying almost completely on the *recipients'* systems of internal control to ensure that only proper payments are requested and that any improper payments are self-identified and corrected by the recipient.

In June 2015, we issued a report on NSF's non-compliance with the Improper Payment Elimination Act (IPERA) requirements for FY 2014. The report identified significant issues

with how NSF executed the risk assessment used by the agency to conclude it was not susceptible to significant improper payments. Specifically, in its risk assessment NSF did not address all of the required risk factors, reached unsupported conclusions for some of the transactions tested, and lacked alignment of the risk indicators with the ultimate conclusion of low risk. In addition, in the quantitative portion of the risk assessment NSF did not consider payments corrected after the fact by recipients to be improper payments, nor did it maintain the stated statistical validity in the execution of its sampling plan. As this was the second consecutive report that found significant issues with NSF's risk assessment, we recommended that the agency conduct a statistically valid sample in order to determine an estimated improper payment rate that would establish once and for all whether or not NSF is susceptible to significant improper payments. While NSF generally agreed with some of the report's findings, it did not believe that it was non-compliant with IPERA.

The *Standards for Internal Control in the Federal Government*, issued by the Government Accountability Office in September 2014 (the "Green Book") states that, "Internal control is a process effected by an entity's oversight body, management, and other personnel..." It further states that, "...management designs control activities so that all transactions are completely and accurately recorded." NSF's challenges in this area are to develop an internal control process that provides reasonable assurance that payments are proper at the time they are made, and to develop a sound process for assessing its risk of improper payments.

Protecting Agency information and IT Resources

The protection of its information systems against unauthorized access or modification is critical to NSF's ability to carry out its mission. As demonstrated by the recent data breach at the Office of Personnel Management, extreme diligence is required to deal with today's increasingly sophisticated threat landscape. In addition to certain recurring IT security weaknesses, NSF has some long-standing issues that warrant increased attention, particularly with regard to its Antarctic Program. NSF management should allocate appropriate resources to correcting these weaknesses and providing increased assurance that the systems and information are adequately protected.

In addition, continuous monitoring of IT systems is essential to the timely identification and mitigation of IT security risks. OMB requires agencies to develop and maintain an information security continuous monitoring (ISCM) strategy and implement an ISCM program in accordance with specific NIST guidelines. Per OMB's guidance, agencies must implement continuous monitoring of security controls as part of a phased approach through Fiscal Year (FY) 2017. NSF's approach to strengthen continuous monitoring includes implementing the DHS Continuous Diagnostic and Mitigation Program and transitioning to ongoing authorization. In this environment of an ever increasing number and sophistication of IT security threats, it is imperative that NSF continue to dedicate the appropriate attention and resources to implementing a robust ISCM program.

Promoting Accountability and Transparency

The Digital Accountability and Transparency Act (DATA Act) directs the federal government to standardize and publish a wide variety of reports and data in order to foster greater transparency over federal spending. Federal agencies must implement the DATA Act by May 2017. The implementation is being led by a joint team from the U.S. Department of the Treasury and the Office of Management and Budget (the DATA Act Project Management Office or PMO). The iterative nature of the Data Act PMO's implementation strategy and evolving federal guidance make it difficult for agencies, including NSF, to integrate the implementation effort into existing IT governance and resource requirements planning structures. Also, there are critical issues that still need to be resolved on a government-wide basis, as well as guidance in key areas that is needed before agencies can fully develop their own project plans.

Other factors also present a significant challenge for NSF in successfully implementing the requirements of the Act including: the potential for necessary modifications to the agency System for Award Management (SAM) interfaces; the lack of available agency FTEs to ensure that adequate staff are dedicated to DATA Act implementation; and the potential that NSF's relocation in 2017 may impact the allocation of additional funding (should it be needed) beyond what is currently planned. Also, the lack of a clear source of funding to make the necessary system and process changes to support implementation presents a risk to the success of the DATA Act implementation. As the guidance on DATA Act requirements is rolled out, cost estimates and implementation plans are likely to change, making it difficult for the agency to adequately prepare.

Managing the Government's Records

In 2011, President Obama signed a memorandum initiating a government-wide effort to reform federal recordkeeping in light of the dramatic increase in the amount of electronic information that the government manages. The Office of Management and Budget (OMB) and the National Archives and Records Administration (NARA) issued a follow-up directive in 2012, which required federal agencies to take specific actions by appointed dates to reform the policies and practices for the management of records, and provide a framework for the management of electronic records.

The U.S. Government Accountability Office (GAO) issued an audit report in May 2015 on the implementation of the directive at 24 departments and agencies, including NSF. GAO found that NSF did not submit a Senior Agency Official report, and did not provide information to NARA on how it intended to manage permanent electronic records, or a date when it would submit this information. Nor did NSF provide a date when its required review for temporary and permanent email records would be completed. Further, GAO found that NSF did not report to NARA that it did not possess any permanent records that were 30 years old or older, as the directive required. Finally, GAO found that as late as March 2015, NSF could not provide a date when it will complete the identification of any portion of its unscheduled records, increasing the risk that it might destroy such records without NARA approving or being aware. GAO made four recommendations to NSF to address the agency-specific findings in the report. NSF should provide a prompt response to GAO's recommendations, and comply with NARA's directive.

OIG's Assessment of the Agency's Progress: NSF needs to devote more attention to its business operations in order to surmount the challenges presented by these four issue areas. While NSF has taken steps to improve its reporting on improper payments in the agency financial records, it confuses the differences between improper payments and unallowable costs. For example, a cost may ultimately be allowable while also being considered an improper payment at the time it was made. And a payment may be considered improper, even if the recipient later identifies and self-corrects the error. Without a better understanding of how an improper payment is defined, NSF will continue to have difficulties assessing whether it is susceptible to improper payments.

NSF also continues to take action to correct IT security issues, although progress in resolving the issues in its Antarctic Program (USAP) have been delayed during the past several years by the changeover to a new Antarctic contractor, as well as the impending expiration of the lease on the USAP's facility in Centennial, CO. During FY 2015 USAP finally replaced a very out-of-date software application used to process personnel, medical, equipment maintenance, and procurement transactions. However, since FY 2006 we have reported that USAP needs to improve its disaster recovery and continuity of operations planning for its Denver data center. The timeline for remediation of this issue is contingent upon the availability of funding. Regarding NSF's continuous monitoring program, DHS recently awarded a contract that will allow NSF to initiate contacts with the contractor and to form a Continuous Diagnostic and Mitigation working group.

With regard to the Data Act, in FY 2015 NSF organized its DATA Act implementation team, and established a governance structure, including a Senior Accountable Official (SAO), an Executive-level Steering Committee, and a NSF DATA Act Working Group (DAWG). NSF also assigned staff to the on-going government-wide working group effort to review, define, and standardize DATA Act data elements; actively participated in other DATA Act-related government-wide activities; and identified agency staff with subject matter expertise for consultation. Finally, NSF issued its initial Data Act Implementation Plan in August, along with its related cost estimate.

Regarding the GAO report on recordkeeping, NSF stated that it is currently preparing a response.

CHALLENGE: Management of the IPA Program

Overview: In addition to its permanent scientific staff, NSF utilizes a rotating staff of external researchers and educators from across the United States to participate in the funding decision process. Those external researchers, called "rotators", constitute roughly 30% of NSF's program officers and also serve in executive positions such as Assistant Directors who lead one of NSF's seven science directorates. Most come to NSF under the authority of the Intergovernmental Personnel Act (IPA) for a period of up to four years, and then return to their home institutions.

Rotating staff are an important component of NSF's workforce and bring valuable experience to the Foundation. In many instances, however, rotators cost more than federal employees performing the same job, and they are frequently away from the office as they continue research

at their home institutions. While we recognize the significant contributions made by rotators, it is essential for NSF to examine the costs associated with the rotator programs – funds spent directly on the rotators and costs associated with the rotator program--to ensure that federal funds entrusted to the Foundation are being spent effectively and efficiently.

Challenge for the Agency: Recent audits and investigations have identified weaknesses in NSF's management of the IPA program, a program that serves as a cornerstone of its scientific and management hiring programs. NSF is challenged to establish and maintain strong oversight of this program to ensure continuity of effective leadership within the Foundation while maintaining high ethical standards and compliance with laws and regulations despite the high personnel turnover rate the program produces.

The challenges associated with NSF's reliance on rotators include: frequent turnover of personnel, management of inherent conflict of interests (COI) that arise from having individuals whose institutions receive NSF funding come to the agency to assist in funding decisions, the establishment and maintenance of transparency in funding decisions, and ensuring that rotators comply with federal laws after they leave NSF. Finally, the additional cost of using IPAs instead of hiring permanent employees is significant; our 2013 audit found that NSF paid an annual additional cost of approximately \$6.7 million or an average of over \$36,000 per IPA for the 184 IPAs we examined.

Managing Conflicts of Interest

In light of the Foundation's reliance on rotators to make funding decisions, it is critical that strong controls are in place to identify and mitigate conflicts of interests (COIs) that occur as a result of rotators' research activities and their connections with their home institutions. Such controls protect rotators—many of whom have never worked in a federal environment—as well as the Foundation itself.

A recent investigative report documented problems with controls over COIs we identified in the context of one rotator's tenure at NSF. We found that:

- No concrete plan to manage the rotator's known conflicts was developed and communicated;
- There were significant delays in the rotator's completion of a required ethics course and her submission of a required financial disclosure form;
- Actions taken to assess the impact of the rotator's COIs on an award she made were seriously flawed;
- The names of the persons who wrote the justification for funding and who actually made the decision to fund the award with which the rotator had conflicts were not included in NSF's system of record, undermining the agency's ability to identify and mitigate COIs; and
- A critical tool used to enforce the one-year cooling off period following the rotator's tenure at NSF was circumvented.

We have recommended that NSF take various actions to strengthen its controls over COIs.

Impact of Frequent Turnover in Management Positions

As noted, IPAs generally serve in executive positions, such as Assistant Directors who lead NSF's science directorates. NSF expects its executives to provide strategic direction, make investment and funding decisions, oversee and monitor grant-making processes, as well as supervise and manage scientific and administrative staff. Currently, six out of seven of NSF's Scientific Directorates are headed by IPAs.

Continual turnover, especially in leadership positions, presents challenges for NSF. Succession planning and knowledge transfer become constant and thus, more critical functions, as NSF is continually recruiting and assessing new leaders. Once they are found and hired, NSF is challenged to ensure these leaders receive training to understand the culture of the Federal government, and how that impacts the day-to-day management of NSF. New leaders must be trained in NSF's government and management processes and systems, and conflicts of interest must be identified and recognized and managed, as current and prior activities of these executives may influence funding decisions and oversight responsibilities. The constant reshuffling of senior management also leads to lack of continuity for programmatic leadership for research initiatives.

Transparency in Funding Decisions

The turnover in program managers, who make significant contributions to funding decisions, also creates a transparency challenge. In one directorate, we identified a concern about transparency regarding grant funding decisions between outgoing and incoming IPAs. Specifically some IPA program officers believed it to be acceptable to carry out a predecessor's decision to fund a proposal. In one instance, after an outgoing IPA negotiated a budget and agreed to fund a proposal, his replacement IPA was expected to complete the funding action without exercising independent analysis of the matter. NSF did not have any record of the first IPA's deliberations on the matter.

Compliance with Federal Laws after IPA Assignment Ends

It is a challenge for NSF to ensure that IPA personnel fully understand their responsibility to comply with federal laws and regulations. We found an instance in one directorate in which an IPA interacted with NSF program officers during the one-year "cooling off" after departure from NSF. An NSF database, used to monitor conflicts by departed IPAs and enforce the cooling off period, was circumvented so that grants officers could not determine that the IPA should not be negotiating a new grant.

Cost of IPAs

Finally, NSF pays IPAs the salary and fringe benefits they were earning at their home institutions in addition to reimbursing them for travel to NSF, temporary living expenses, lost consulting income and state income taxes if the IPA in some instances. With respect to salaries, we found that for one year NSF paid an additional \$3 million for IPA salaries, and, that, in August 2012,

54 IPAs' salaries exceeded the federal executive pay limit of \$179,700. NSF paid 34 of these IPAs an annual salary of \$200,000 or more; the highest annual IPA salary was over \$300,000.

We calculated that NSF paid nearly \$800,000 in additional fringe benefit costs for IPAs and paid more than \$337,000 for lost consultations. We recommended that NSF evaluate ways to reduce IPA costs such as increasing telework from IPAs' home institutions and increasing cost sharing. While NSF has developed a plan to examine higher costs for IPAs, it has not yet implemented concrete actions.

OIG's Assessment of the Agency's Progress: NSF informed us that it communicates COI standards to rotators before they arrive and that it reinforces this information to each rotator in an email message after the rotator starts at NSF. With respect to transparency in funding decisions, NSF stated that it will review program management training to incorporate "best practices" related to funding decisions including that an outgoing program officer cannot bind an incoming program officer to recommend an initial award. In addition, NSF implemented a process to orient and train IPAs who are unfamiliar with federal government processes and practices.

In response to our audit of IPA costs, NSF stated that it would initiate actions that would balance potential costs reductions with possible effects on either recruitment efforts or the effectiveness of IPA working arrangements. NSF also informed us that in order to identify an appropriate set of actions, it undertook an assessment of mechanisms to reduce the cost of IPAs.

With respect to our findings related to controls over rotators' COIs, we remain concerned that additional attention is needed in this area and are currently assessing ways for us to evaluate the extent to which the problems we identified in one division are occurring across the Foundation.

With respect to the added costs of IPAs, in August 2014 NSF identified several actions it could take to reduce the added costs of IPAs. Unfortunately, as of the end of this reporting period, little progress had been made in accomplishing those actions.

CHALLENGE: Moving NSF Headquarters to a New Building

Overview: NSF was scheduled to occupy its new building in December 2016, and to be out of its existing buildings by February 2017. However, due to delays from an impasse in negotiations between NSF and its Union on workstation sizes and allocation of shared and support space, GSA negotiated the rental start date to September 1, 2017 at a delay cost of approximately \$14.5 million.

Challenge for the Agency: If NSF causes additional schedule delays, it may need to extend these leases, which would require it to continue paying rent at two locations, with the rent for the current buildings likely being higher than it currently is. The revised relocation schedule includes little slack time and two phases of negotiations still need to be completed. The risk of further delay is considerable in light of the number of items that have to be negotiated with the union and the tight deadlines for resolving differences.

NSF faces four major risks to moving to its new headquarters before leases at its current buildings expire December 31, 2017. First, NSF lacks a detailed master schedule for its move. Second, NSF will have to negotiate with its union on several furniture-related and space issues, and has little time to do so. Third, the current schedule includes fewer opportunities for design review and a shorter time to complete these reviews. Finally, NSF faces risks because its new building has less storage space and the agency lacks an approved record schedule allowing destruction of underlying hard copy documents. These risks are exacerbated by constant leadership turnovers and the lack of a single person responsible for the project who has direct access to the Director. We have issued two alert memos to the NSF Director raising concerns about continued schedule delays and the risk of the associated higher costs.

OIG's Assessment of the Agency's Progress: With assistance and input from GSA, NSF's schedule for the move was revised, which reduced the original delay by approximately six months. NSF successfully met two deadlines for reviewing interior design. NSF has informed us that a contractor will present workstation layout design options to both NSF and Union together. It is NSF's view that presenting options in this manner may help NSF and the Union reach agreement on this issue.

NSF continues to face significant challenges with respect to union negotiations for items which must be decided within a short time. Therefore, we continue to encourage NSF senior management to focus the highest level of attention on its move to its new headquarters.

CHALLENGE: Management of the U.S. Antarctic Program

Overview: Antarctica is the coldest, driest, windiest, most remote continent on earth. The weather changes frequently and abruptly; temperature drops of as much as 65 degrees Fahrenheit in twelve minutes have been recorded.

NSF, through the United States Antarctic Program (USAP), manages U.S. scientific research in Antarctica. The program's goals are: to understand the Antarctica and its associated ecosystems; to understand the region's effects on, and responses to global processes such as climate; and to use Antarctica's unique features for scientific research that cannot be done as well elsewhere. The Antarctic Support Contract, which was awarded to Lockheed Martin in December 2011 is NSF's largest contract, valued at nearly \$2 billion over 13 years.

Challenge for the Agency: Establishing and maintaining a world-class scientific research program in Antarctica's remote and harsh environment is a formidable logistical challenge. The July 2012 report by the Blue Ribbon Panel, commissioned by NSF and the Office of Science and Technology Policy, focused on eight major areas including capital budgeting, communications, and health and safety, which presented the most significant challenges.

NSF developed a matrix to track its progress in implementing recommendations from the Blue Ribbon Panel report. In June 2013, we issued a memorandum to NSF making several suggestions to improve the usefulness of this matrix, such as including timelines for action and identifying a responsible person for each action. Our 2013 audit of the medical screening process for travelers to Antarctica found that NSF's medical review panel has made

recommendations that could reduce the cost of this process, but NSF has not implemented many of these recommendations.

Another challenge for NSF is to control the cost of the USAP and to ensure adequate oversight of payments to the USAP contractor. For example, for the last five years the medical review panel recommended that NSF base required medical tests on factors such as how long an individual will be in Antarctica, and what their duty station and job responsibilities will be. Revising the number of medical tests performed to reflect these criteria could lower costs of the screening process, which currently totals approximately \$860 per person.

Our July 2015 audit of the health and safety of USAP participants identified four areas for improvement in: 1) developing a process to identify, respond to, track, and collect data on all misconduct incidents that occur in USAP; 2) improving pharmacy operations; 3) ensuring Special Deputies in the Antarctic have adequate tools and training to perform their law enforcement responsibilities; and 4) enforcing and potentially expanding the requirement for breathalyzer tests.

OIG's Assessment of the Agency's Progress: NSF has been tracking progress against the Blue Ribbon Panel recommendations in its working matrix and has improved that document in response to our recommendations. In response to our audit on reducing costs of the medical screening process, NSF concurred with the OIG's recommendations and has formalized its process for addressing and tracking medical panel recommendations.

NSF generally agreed with the recommendations in our 2015 health and safety audit and informed us that it plans to take several steps to implement the recommendations such as sharing information on violations of the Code of Conduct and issuing a reminder to the contractor regarding management of drug interactions and making patients aware of drug safety information.

In addition, NSF informed us that it authorized the contractor to obtain breathalyzers that do not require calibration and that the contractor recently updated the manuals for the medical clinics, including procedures related to controls over medication. Finally, NSF plans to host a law enforcement site visit to Antarctica.

Finally, NSF has informed us that it does not plan to develop a process to identify and track misconduct by all USAP participants, including researchers. As a result, NSF lacks information needed to prevent or limit future misconduct, which increases the risk that future problems may go unaddressed and possibly become more severe. The lack of such information about all USAP participants may also undermine the agency's ability to ensure that similar infractions are handled consistently, whether they are committed by a researcher or a contractor employee.

CHALLENGE: Improving Grant Administration

Overview: Making grants in support of promising scientific research is NSF's primary business and a key element of its mission. In FY 2014, NSF acted on more than 48,000 proposals for research, education and training projects, and funded close to 11,000 new awards. As of

September 30, 2015, NSF had a portfolio of over 48,000 active awards totaling approximately \$32.5 billion. Since most of these awards are grants, it is vital that NSF's grant-related business processes ensure that grantees spend their funds appropriately.

Challenge for the Agency: Ensuring that grant funds are spent as intended has always been challenging because grant recipients are not required to present supporting documentation, such as invoices and receipts, in order to receive payment from the agency. In addition, while recent efforts to reduce the administrative impact on grantees are commendable, accountability for public funds should not be compromised in the process. Therefore, the challenge for NSF is to implement controls over the spending of grant funds that ensure transparency and accountability, but do not create undue administrative impacts on awardees and federal program officers.

One step NSF and other federal agencies have taken to reduce the burden on researchers is to streamline the written guidance for administering grants. However, we are concerned that in an effort to reduce the guidance, some clarifying text has been eliminated that may lead to inconsistent interpretations and directions being given to awardees. With scores of program officers fielding questions from numerous awardees on a daily basis, NSF will be challenged to provide consistent guidance that does not contradict previous responses or its written policies.

On December 26, 2013, OMB issued its final rule, 2 CFR Part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards" (Uniform Grant Guidance or UGG). The UGG streamlined eight OMB administrative, cost, and audit circulars into one circular that covers all types of non-federal entities that receive federal awards. NSF revised its *Proposal & Award Policies & Procedures Guide* to implement the UGG. Changes included in the revised Guide became effective December 26, 2014. As NSF makes new awards and renews existing ones under the revised Guide, it should monitor implementation of the new policies to ensure that no unintended consequences arise as a result. Also, as noted in last year's Management Challenge, OMB raised the single audit threshold from \$500,000 to \$750,000, effectively removing audit coverage on millions of dollars in NSF funding. NSF will need to take additional steps to oversee the awardees who fall below the threshold.

In addition, OMB changed requirements related to documentation of labor effort, making it more challenging to assess the allowability of salaries and related costs on an ongoing basis. Under the UGG, colleges and universities are permitted to charge awards for salary costs based on budget estimates rather than on the actual work performed, provided only that "significant changes" are entered "in a timely manner" and that the final amount charged to the federal award is accurate, allowable, and properly allocated. NSF faces the challenge of implementing OMB guidance over awardee spending for research salaries—generally the largest item of expense in research awards—that only requires awardees to ensure salary costs are reasonable at the end of an award.

As OMB is changing its documentation requirements for research salaries, ongoing initiatives to reduce administrative requirements on sponsored researchers present additional challenges to NSF. Among these is an effort to change the manner in which salaries are certified as allowable charges to federal grants. OIG recently issued reports on implementation of pilot payroll

certification systems at two NSF awardee institutions.¹ Our audits highlighted the challenges NSF faces in providing effective stewardship over taxpayer money without placing unnecessary administrative burdens on researchers. The reports noted that any system's ability to properly account for federal research funds relies on the controls built into the system. They reminded NSF to reinforce with its awardees the need to design and implement controls that reduce the risk of improper charges to federal awards and provide a means to ensure the controls are achieving that objective.

Finally, OMB significantly shortened the audit resolution timeframe. Prior to the UGG, federal agencies had 6 months to issue management decision letters on findings affecting the agency from the time they received an audit report. The new OMB requirement allows 6 months from the date that *the report is submitted to the Federal Audit Clearinghouse*. For NSF, this change would effectively shorten the audit resolution timeframe by 30 days, unless the agency can establish a new accelerated process for identifying and tracking reports that require resolution.

OIG's Assessment of the Agency's Progress: NSF took several actions this past year to strengthen grant administration but more are needed. As previously noted, the agency's revised *Proposal & Award Policies & Procedures Guide*, implementing the UGG, became effective in December 2014. OIG and NSF continue to discuss transferring responsibility for identifying single audit findings that require NSF resolution to NSF. Finally, NSF continues to use its Award Monitoring and Business Assistance Program (AMBAP) which includes baseline and advanced monitoring activities. During advanced monitoring, NSF assesses the internal controls of its awardees to ensure adequate administration of the NSF awards. During FY 2015, NSF planned and completed 30 Advanced Monitoring Site Visit reviews and 147 desk reviews.

Challenge: Encouraging the Ethical Conduct of Research

Overview: Congress passed the America COMPETES Act in 2007 to increase innovation through research and development, and to improve the competitiveness of the United States in the world economy. NSF responded to the Act by mandating mentoring plans for all postdoctoral positions and directing that grantees provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate and graduate students, and postdoctoral researchers participating in the proposed research project.

However, information collected during investigations, site visits, and reviews of institutional Responsible Conduct of Research (RCR) plans suggests that some institutions consider RCR as just another compliance requirement, rather than part of its educational mission. Furthermore, some research suggests that many of the ethics training programs currently available do little to change the perspectives of students and postdocs regarding the ethical conduct of research. As more stories about research misconduct circulate in the media, the public's confidence in the research enterprise is weakened and taxpayer support of science is undermined. NSF is therefore challenged to provide more oversight on institutional implementation of these requirements and to provide meaningful guidance regarding RCR training.

¹ Reports on pilot implementation at George Mason University (OIG 15-1-017, issued July 31, 2015) and Michigan Technological University (OIG 15-1-023, issued September 30, 2015).

Challenge for the agency: NSF's primary challenge is to ensure that awardees implement effective RCR programs. At a time when opinion surveys indicate more Americans are becoming distrustful of science, it is important that the conduct of scientific research not be tainted by instances of misrepresentation or cheating. Recent surveys also suggest that cheating is endemic at various levels of education, with 30% of researchers admitting to engaging in questionable research practices or knowing someone who has engaged in such practices.

Consistent with these survey results, OIG has seen a dramatic increase in substantive allegations of plagiarism and data fabrication since 2004, especially as it relates to junior faculty members and graduate students. The number of allegations investigated has grown from a low of 45 in 2004 to 75 this past year. Even more important, however, has been the rise in serious instances of research misconduct as evidenced by the number of research misconduct findings by NSF. In 2004, two research misconduct findings were made, while in 2014 there were 20 research misconduct findings.

In addition, OIG has seen a substantial increase of allegations related to peer-review based confidentiality violations, false representations in CVs, false representations of publications in annual/final reports, failure to list all affiliations and current support (especially at overseas institutions), and fraudulent or otherwise improper use of grant funds. The number and variety of ethical issues identified in our investigative activities suggest that institutions have not sufficiently emphasized research integrity as a core value – not only at the student level but at the faculty level as well.

The NSF Act places responsibility on NSF to strengthen scientific and engineering research potential at all levels in various fields. NSF's research and training programs reach individuals who are ultimately employed by academia, industry, and government. These individuals could have a broad and positive impact on the US science, engineering, and education workforce. NSF has been responsive to recommended actions contained in our individual research misconduct investigation reports. However, such agency actions only address incidents after the fact. Extrapolation of the number of allegations OIG has received across the 40,000 proposals NSF receives annually, suggests that approximately 1200 proposals could contain plagiarism and up to 800 proposals or NSF-supported research results (e.g., papers and annual/final reports) could contain falsified or fabricated data. Since NSF funds research in virtually every non-medical research discipline, and its funding reaches the educational range of kindergarten through post-Ph.D., the agency is in a unique position to lead the government response to these disturbing trends and have an impact across all levels of education.

OIG's Assessment of the Agency's Progress: The agency responded to the America COMPETES Act by creating a requirement that grantees submit mentoring plans for all NSF-supported postdoctoral positions and by requiring that grantees 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 NSF-funded research project. However, in contrast to the RCR requirements adopted by NIH in 2010, those implemented by NSF do not have specific course requirements, nor do they provide guidance about the content, structure, or format of the courses.

Other actions the agency has taken include the development of a new ethics research program called Cultivating Cultures for Ethical Science Technology Engineering Mathematics (CCE STEM). The CCE STEM research effort is focused on identifying the factors that create climates that foster and encourage research integrity rather than focusing on curriculum development on integrity issues. The Agency also worked with the National Academies to develop and make available ethics materials that will be applicable across all scientific fields that NSF supports.

OIG has developed a plan to systematically review RCR plans that were initiated as a result of the NSF's implementation of the America COMPETES Act. We have requested RCR plans from 50 random grantee institutions, and have so far reviewed about one half of the plans. To date, OIG has observed a broad disparity among grantee responses to the RCR requirement, which range from high-quality mentoring programs, to programs that simply refer students to web-based training, to schools that are unaware of the RCR requirement. Early educational intervention remains critical to any effort to ensure that students understand proper professional practices and the implications of failing to follow them.

OIG continues to receive substantive data fabrication/falsification allegations involving students, post-docs, and faculty. We currently have 38 active investigations regarding such allegations, an increase of 58% over the previous year. Therefore, we believe that more needs to be done to address this problem, and NSF should exert its influence with institutions regarding this important issue.


NATIONAL SCIENCE FOUNDATION
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October 27, 2015

MEMORANDUM

TO: Ms. Allison Lerner
Inspector General, National Science Foundation

FROM: Dr. France Córdova 
Director, National Science Foundation

SUBJECT: Acknowledgement of the Inspector General's FY 2016 Management Challenges Memorandum and Transmittal of NSF's Progress Report on the FY 2015 Management Challenges

This serves to acknowledge receipt of your memorandum dated October 15, 2015, summarizing what the Office of Inspector General (OIG) considers to be the most serious management and performance challenges facing the National Science Foundation (NSF). These challenges include: establishing accountability over large cooperative agreements; managing NSF's business operations; managing NSF's Intergovernmental Personnel Act (IPA) program; moving NSF headquarters to a new building; managing the U.S. Antarctic program; improving grant administration; and encouraging the ethical conduct of research. As in past years, your memorandum has already been shared with NSF's executives and senior officers.

NSF's senior leadership will continue to address these issues through collaborative, cross-agency communication and action. Also included with this memorandum is NSF's progress report highlighting the significant actions taken in FY 2015 on the management challenges outlined in your November 5, 2014, memorandum. The report provides anticipated next steps, which will serve as a prospective guide for many of the actions planned for FY 2016.

As always, NSF remains committed to serving the research community effectively, to continually improving stewardship across the agency, and to safeguard Federal funds awarded by NSF in support of the mission. We look forward to continuing to work with your office to achieve these goals.

Attachment

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

National Science Foundation (NSF) Fiscal Year (FY) 2015 Progress Report on OIG Management Challenges

CHALLENGE: Establishing Accountability over Large Cooperative Agreements

NSF Overview: This Office of Inspector General (OIG) challenge relates to NSF’s use of cooperative agreements to construct and fund the operations and maintenance of large research facilities. The Foundation currently utilizes end-to-end cost surveillance policies and procedures for its cooperative agreements to ensure adequate stewardship over federal funds. These activities are carried out via the decisional and governing responsibilities of the Office of the Director and the National Science Board, respectively, and through the management and oversight responsibilities of the sponsoring Science and Engineering Directorates and Offices and the NSF Chief Financial Officer (CFO), Office of Budget, Finance and Award Management (BFA). Additionally, the Major Research Equipment and Facility Construction (MREFC) Panel, comprised of NSF Senior Management representatives from across the agency, provides governance of the overall MREFC process, reviews specific cases as presented by the originating program office, and defines the specific implementation processes utilized by NSF to oversee, assess, prioritize, and fund major research infrastructure projects that utilize the MREFC account. Within BFA, the CFO relies on the Large Facilities Office (LFO) to develop policy related to large facilities, to advise NSF management on large facility issues, to coordinate with and assist program offices on large facility management by Recipients, and to help provide assurance related to NSF oversight. Other BFA units, including the Division of Acquisition and Cooperative Support, Cooperative Support Branch (DACS/CSB) and the Cost Analysis and Audit Resolution (CAAR) Branch under the Division of Institutional and Award Support (DIAS), are engaged in budget and award development and monitoring related to large facilities. NSF is currently implementing enhancements to its pre-award and post-award budget and cost review processes (initiated in June 2014 and further updated in March, June, and September of 2015) for large research facility cooperative agreements to include additional analysis of awardee cost proposal budget information and the utilization of incurred cost audits, to the extent appropriate based on risk, to strengthen the review of proposed and actual costs. For construction awards, these strengthened procedures include requirements for an independent assessment of the Recipient’s cost proposal that will inform the NSF cost analysis (implemented in June 2014).

a. *Establish accountability for the billions of federal funds in NSF’s large cooperative agreements at the pre- and post-award stages and throughout the lifecycle of projects.*

NSF’s Significant Actions Taken in FY 2015:

- Revised and strengthened internal Standard Operating Guidance for accomplishing the NSF cost analysis of construction cost proposals and use of incurred cost audits in awarding and administering large facility related cooperative agreements as set forth in corrective action plans from previous audit reports. This Guidance incorporates the requirement for an independent cost assessment as part of the NSF analysis.
- Implemented the new cost analysis guidance on one potential MREFC project (Regional Class Research Vessel).
- Published revised policy and guidance on the planning and use of budget contingency in large facility cooperative agreements in the Large Facilities Manual (15-089, June 2015) following resolution of the audit escalation on contingency.
- Published revised, strengthened policy on management fee in large facility cooperative agreements in the Large Facilities Manual (15-089, June 2015).
- Implemented the new policy on management fee on seven (7) large facility cooperative agreements.
- Completed draft standards for the preparation of construction cost estimates and operational budget proposals by Recipients for publication in the next revision of the Large Facilities Manual in FY 2016.

Appendix 3B: NSF FY 2015 Progress Report on OIG Management Challenges

	<ul style="list-style-type: none"> Published Standard Operating Guidance setting forth a risk-based approach to determining the need for audit services prior to awarding large facility related cooperative agreements above \$100M (approximately twenty five awards). <p>NSF’s Anticipated Next Steps:</p> <ul style="list-style-type: none"> Implement mechanisms for accomplishing the independent cost assessment for new construction and use of audit services for incurred cost audits. Develop an implementation plan for application of strengthened construction award oversight to operational awards.
<p><i>b. Ensure that costs proposed for and incurred under the LSST were fair and reasonable, and that proposers’ accounting systems were adequate to bill the government properly.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> Continued to ensure that awardees of large construction projects were managing their risks and properly accounting for contingency by reviewing the project’s risk management process, and monitoring both the allocation of contingency and the project’s mitigation of identified risks as identified in the monthly report. This included a detailed contingency review for the LSST project in April 2015 following the newly developed NSF requirements on contingency. Enhanced NSF oversight through establishment of a standardized monthly reporting format by the LFO. This includes Earned Value Management (EVM) metrics and trends that are communicated bi-monthly to the Office of the Director. Continued to assess compliance performance of large facility awardees by conducting four Business System Reviews (BSRs) and related post-BSR monitoring activities. <p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> Continue the practice of LFO and program office review of contingency allocation and accounting through monthly reports and yearly progress reviews for all ongoing projects. Provide training and routine assistance by LFO to facility program officers on risk management and the appropriate allocation and accounting of contingency for MREFC projects. Continue Business System Review activities. Receipt and evaluation of the independent report from the National Academy of Public Administration (NAPA) on NSF’s use of cooperative agreements to support large scale investments in science and technology, expected December 17, 2015.
<p>CHALLENGE: Improving Grant Administration</p> <p>NSF Overview: NSF manages awards throughout the project life cycle from pre-award through closeout. As of mid-FY 2015, NSF was managing 41,507 active awards, representing \$27.9 billion in obligated funds to 2,924 unique awardees. NSF policies, business practices, and information technology (IT) systems – the foundation of NSF accountability efforts – constantly evolve to align with changes in federal regulations, legislative mandates, and agency-specific requirements. During FY 2015, NSF continues to see benefits deriving from technology investments designed to strengthen its business infrastructure. iTRAK, a modernization of NSF’s 30-year old financial system, has been fully implemented, and is providing increased transparency and capacity for generating data needed for decision-making and oversight. Its implementation follows that of the Award Cash Management Service (ACMS), NSF’s re-designed awardee payment process, that has enabled the Agency to obtain award-specific expenditure data based on near real-time cash transactions. Re-engineering requirements for the modernization of its</p>	

<p>Award Management System are under development and will be implemented incrementally over the next several years. In FY 2015, NSF has been actively engaged in two important federal initiatives: (1) NSF fully implemented the <i>Uniform Guidance: Cost Principles, Audit, and Administrative Requirements for Federal Awards</i>, and has continued to support the Office of Management and Budget (OMB) Council of Financial Assistance Reform (COFAR) in developing Frequently Asked Questions to bring further clarity to these regulations. And, (2) in support of transparency and accountability, NSF is participating in interagency efforts to develop the Data and Accountability Act framework and prepare for its implementation, as well as ensure that its published abstracts are tied to national interest as defined by the National Science Foundation Act of 1950. NSF also continued its important work related to strengthening transparency and accountability in connection with the merit review process, specifically concerning the role of Division Directors (DDs). This past year, NSF and its Office of the Inspector General continued to clarify roles and responsibilities in the use of data analytics for audits and audit resolution, as well as to develop common understanding of selected NSF policies. Finally, NSF continues to expand and upgrade mechanisms for communicating policies, procedures, and business practices within this dynamic environment to its staff and external stakeholder communities.</p>	
<p><i>a. Implementing controls over spending that ensure transparency and accountability without creating undue administrative impact on awardees and federal program officers.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> • Initiated streamlined processes for “Do Not Pay” results and improved implementation of internal controls to identify grantees that require corrective action plan follow-up. • Convened the NSF Transparency and Accountability Working Group (TAWG 2) to address the recommendation from an FY 2014 working group on strengthening transparency and accountability to clarify the roles and responsibilities of the DD around the merit review process. • Implemented the TAWG 2 recommendations by way of the Proposal & Award Manual (PAM) which went into effect on September 1, 2015. Guidance in the PAM was supplemented to clarify the roles and responsibilities of Division Directors with regard to the merit review process.
	<p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> • Ensure that awards meet “Do Not Pay” requirements and continue to utilize the internal controls in place to assist in the monitoring of corrective action plan follow-up. • Continue to consider transparency and accountability measures relating to the NSF Merit Review process as appropriate. • Integrate the on-boarding materials and training for DDs into the Merit Review Basics updated courses via the NSF Academy.
<p><i>b. Provide consistent messages across the spectrum of authorities and ensure different NSF replies do not contradict each other or written policy.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> • Provided a summary of significant changes and other clarifications at the beginning of each issuance of NSF internal and external policies and procedures documents. • Provided training to NSF program staff with the release of each major policy issuance, as well as the entire suite of grant conditions. Such training occurred in NSF-wide Town Hall meetings, as well as division All Hands Meetings, as requested. • Conducted presentations/training (on-site and virtually) at major conferences of professional research administration societies, as well as NSF Grant Conferences on NSF implementation of the Uniform Guidance and related policy matters.

	<p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> Continue an active program of outreach to internal and external stakeholder communities to promote thorough understanding of NSF policies and procedures and relevant federal regulations.
<p><i>c. Due to Uniform Guidance changes increasing Single Audit threshold from \$500,000 to \$750,000, NSF will have to do more to ensure appropriate oversight of awards from \$500,000 to \$750,000 as they will no longer be subject to Single Audits.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> Completed timely implementation of the <i>Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance)</i>, fully upgrading all relevant policies, procedures, and award terms and conditions. Continued to support the <i>Uniform Guidance Work Group</i>, assisting the Office of Management and Budget (OMB) Council on Financial Assistance Reform (COFAR) in developing Frequently Asked Questions that clarify the federal requirements set forth in the <i>Guidance</i>. Increased weighting factors in the FY 2015 Annual Risk Assessment for 166 (7%) of NSF awardees managing high-risk awards and receiving more than \$500,000 in NSF funding thereby increasing their probability of being subject to advanced monitoring. <p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> Continue to strengthen the NSF annual risk assessment of awards and institutions to ensure appropriate levels of oversight across its entire investment portfolio.
<p><i>d. Due to Uniform Guidance changes in labor effort reporting, it may be more difficult to determine the allowability of salaries and related costs. Collectively, these changes may increase workload for BFA Staff.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> Completed timely implementation of the <i>Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance)</i>, fully upgrading all relevant policies, procedures, and award terms and conditions. Continued to support the <i>Uniform Guidance Work Group</i>, assisting the Office of Management and Budget (OMB) Council on Financial Assistance Reform (COFAR) in developing Frequently Asked Questions that clarify the federal requirements set forth in the <i>Guidance</i>. Assessed impact of <i>Uniform Guidance</i> on analysis of salaries and related costs, and determined no detrimental impact to date on BFA staff workload in assessing allowability. <p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> Continue a strong program of oversight ensuring that NSF awardees have implemented relevant policies, procedures, and systems to adequately document salaries, wages, and related costs. Consult with the National Science Board on any proposed changes to reporting that would adversely impact efforts to reduce administrative burden.
<p><i>e. Due to Uniform Guidance changes in the NSF audit resolution timeframe</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> Hired two additional cost analysts in the Cost Analysis and Audit Resolution (CAAR) Branch to mitigate the effect of other oversight priorities on timely audit resolution. Continued applying risk assessment strategies focusing CAAR resources on those audit reports with findings most critical to the

<p><i>will be shortened by 30 days unless NSF can establish a new accelerated process.</i></p>	<p>oversight of NSF investments.</p> <p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> • Complete onboarding and initiate training of two additional CAAR cost analysts allowing for increased attention to the audit resolution functions.
<p>CHALLENGE: Management of the U.S. Antarctic Program</p> <p>NSF Overview: Through the Division of Polar Programs in the Directorate for Geosciences, NSF funds and manages the U.S. Antarctic Program (USAP), which supports United States’ research and national policy goals in the Antarctic. Given the remote location, an extreme environment and the short period of time during which the continent is accessible, significant challenges exist for ensuring the availability of necessary logistics, operations and science support. There are also unique and internationally-linked environmental, health and safety issues present at the remote location. In exercising its management responsibilities, NSF relies on internal staff with the requisite expertise as well as a network of contracted support and federal agency partners. Periodically, the program is reviewed by external panels of experts.</p>	
<p>a. <i>Establishing and maintaining a world-class scientific research program in Antarctica’s remote and harsh environment and providing a point-by-point response to the 2012 U.S. Antarctic Program Blue Ribbon Panel Report recommendations.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> • Continued progress on activities in accordance with the agency’s official initial response to the Blue Ribbon Panel Report (BRP). That response was published in March 2013 by the NSF Director and the Chair of the National Science Board. • Completed the supply chain software modernization and decommissioning of legacy Advanced Revelation (AREV) applications that had become unsupported for security and software support. • Continued development of the Antarctic Infrastructure Modernization for Science (AIMS), a potential Major Research Equipment and Facilities Construction (MREFC) project to address major infrastructure upgrades recommended by the BRP report for McMurdo Station. • Palmer Station will be addressed with funding from the NSF Research and Related Activities appropriation account. <p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> • Continue progress on BRP recommendations, including investment in prioritized lifecycle acquisitions and infrastructure upgrades. • Conduct preliminary design for the AIMS MREFC project in preparation for the Preliminary Design Review (PDR). • Continue resolution of outstanding actions via NSF’s AIMS project, a potential MREFC project to address major infrastructure upgrades recommended by the BRP report for McMurdo Station. • Proceed with addressing Palmer Station infrastructure needs using funding from the NSF Research and Related Activities appropriation account.
<p>b. <i>Controlling the cost of the USAP and ensuring adequate oversight of payments to the USAP contractor.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> • Implemented a corrective action plan in response to OIG-identified issues including payments and privity of contract. The plan included improved review and oversight of invoices from its subcontractors. • Continued to review and approve invoices to the USAP contractor, including staff whose primary responsibility is review and resolution of invoiced amounts with the contracting officer and contracting officer’s representative prior to approval, a documented

	<p>process initiated in FY2013.</p> <ul style="list-style-type: none"> • Questioned invoiced costs when necessary and worked with the USAP contractor for adjustments to billing amounts.
<p>c. <i>Addressing cost containment issues, i.e. inherent risk of poor performance and cost overruns.</i></p>	<p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> • Continue to monitor invoices from the USAP contractor in accordance with established procedures. <p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> • Continued close coordination among the contractor, the NSF program office (GEO/PLR), and the contracting officer (BFA/DACS) during the annual planning and budget approval process. The current arrangement for the Antarctic Support Contract is within requirements set out in the Federal Acquisition Regulation (FAR) and NSF contracting procedures. Prior to awarding the support contract, the Defense Contract Audit Agency (DCAA) performed pre-award audits. In addition, the contractor has Defense Contract Management Agency (DCMA) approved business systems. • Conducted an annual evaluation of the contractor’s performance that feeds into the determination of award fee received on the cost-plus component of the contract. This multi-tier review process includes an assessment of overall technical, cost, and business performance, and is developed based on monthly assessments from activity based managers, which feed into the annual performance evaluation by the Performance Review Board. The award fee recommendation developed by the Performance Review Board is then reviewed by the Fee Determination Official, who, in consultation with the contracting officer, makes the final determination of award fee earned. Contractor performance is also reported through the government-wide CPARS tool. • Established a coordination group to work with executive management from the USAP prime contractor regarding the potential sale or spin-off of the business unit of the prime contractor currently supporting the USAP. <p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> • Continue to monitor contractor performance on the cost-plus award fee elements of the USAP contract and conduct performance evaluations in accordance with the award fee plan incorporated as part of the USAP contract. • Continue regular meetings with executive management from the USAP prime contractor to ensure that cost containment and performance risk issues are addressed during discussions and implementation of the longer-term future of the business unit supporting USAP.
<p>CHALLENGE: Moving NSF Headquarters to a New Building</p> <p>NSF Overview: In April 2013, capping off five years of planning, economic challenges and negotiations, the House Committee on Transportation and Infrastructure authorized, through a General Services Administration (GSA) prospectus resolution, a new long term replacement lease for NSF. GSA’s competitive action for the lease was limited to Northern Virginia, which resulted from three Expressions of Interest (EOI) advertisements. Using a low cost-technically acceptable procurement approach, the award was made to the Hoffman Company of Alexandria, Virginia in June 2013 and included a pre-designed, to-be-constructed office building to be completed and occupied by NSF in the first quarter of FY 2017 (12/30/2016). The new lease offered financial terms that demonstrated significant savings (approximately \$65 million) to the government and to NSF over the life of the lease, and was less costly than maintaining NSF in its current location. NSF’s existing leases were extended for 48 months (at a premium) beyond their original expiration to accommodate the time required to design, build, and relocate the agency. Immediately after the new lease signing, NSF embarked on a wide-ranging set of efforts with GSA, the new building owner (Hoffman) and internal NSF stakeholders to ensure NSF could meet the aggressive relocation schedule. The new HQ building lease transferred ownership to USAA Realco, Inc. in April 2015 who, along with their development manager, Lowe Enterprises, is working collaboratively with GSA and NSF to formulate schedule strategies that address NSF’s relocation objectives. In an effort to complete the design, NSF and the American Federation of Government Employees (AFGE) Local 3403 underwent formal negotiations,</p>	

with the Federal Services Impasse Panel (FSIP) resolving an impasse.	
<p><i>a. Risk of continued projects delays which could impact milestones such as interior construction and the occupancy date.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <p>Actions taken related to the negotiations with AFGE Local 3403 and the FSIP decision:</p> <ul style="list-style-type: none"> • Implemented the FSIP decision related to office and workstation sizes. • Provided GSA a timely response to the Modified 35% Design Intent Drawings, which reflected space determinations ordered by FSIP. • Modified the Program of Requirements to comply with the FSIP order. <p>Actions taken to mitigate schedule delays:</p> <ul style="list-style-type: none"> • Along with GSA, negotiated the financial impact of the FSIP order with the owner, reducing NSF’s liability from an estimated \$54 million down to \$14.5 million. In addition, negotiated a revised project schedule that limited the delay to 8 months rather than the owner’s original proposal of 16 months. • Managed design and engineering tasks in concert with GSA and the building owner to pursue NSF’s move completion by the lease date of December 30, 2017, despite unforeseen hurdles. • Resumed regular meetings with the AFGE Local 3403 on project information, pre-decisional items as well as impact and implementation issues. Worked with the NSF Labor Relations Officer (LRO) and the AFGE throughout FY 2015 to collaborate with and respond to the AFGE’s issues about the planning for the new building. • Completed the 65% Design Intent Drawing review in accordance with the project schedule. • Updated internal cost estimates for personal property and began a Value-Engineering (VE) process to align costs with available funding. Established OIRM management team to prepare VE options and brief senior leadership on recommendations. Established a framework to develop construction VE options with the owner.
	<p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> • Continue to work with GSA and new headquarters ownership project construction team to re-assess the project schedule for opportunities to deliver the building earlier. • Develop an Integrated Project Schedule that identifies the project’s critical path, assigns responsibility, and forms the basis for tracking progress. • Ensure all procurements are awarded in accordance with the Integrated Project Schedule. • Manage FY 2016 relocation-related procurement activities; ensure that the FY 2016 and FY 2017 procurement and budget schedules support and align with the projected relocation timeline. • Work closely with GSA contracting officials and GSA management to ensure NSF receives complete deliverables and cost estimates as agreed upon in the settlement. • Continue to work with each directorate, NSF leadership and the AFGE Local 3403 to implement NSF’s updated design. Oversee design completion and building planning and relocation efforts consistent with those program requirements and project schedule. • Brief senior leadership on VE options and drive decisions that control costs, and provide a functional headquarters that helps NSF meet its mission.

<p><i>b. Planning and logistics of the actual move to the new headquarters building.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <p>Completed the collection of FY 2017 panel meeting projections in order to discuss and propose final relocation/move operations approach and determined that panel meetings can continue throughout the move at either location or both. This can be achieved if room availability is provided 6-8 months in advance.</p> <p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> • Determine the strategy to move employees into the new building in accordance with the project schedule. Communicate plan with senior leadership, AFGE, and directorates. • Engage OIRM essential senior staff to centralize relocation planning and identify potential move-related cost-impacts. • Mitigate costly change orders and additional fees of NSF move-related procurements by managing them in close alignment with GSA and the lessors’ space delivery and move-in schedules. • Determine phasing for the move based on current and new building constraints and other major move assumptions associated with IT, furniture, elevator and dock availability, etc.
<p>CHALLENGE: Managing Programs and Resources in Times of Budget Austerity</p> <p>NSF Overview: Across the board, NSF has made significant progress towards reducing certain administrative costs by identifying and implementing efficiencies, by prioritizing work, by eliminating or scaling back the scope of some activities, and by exploring new ways of getting the job done. Travel costs have been reduced by 32 percent below the FY 2010 baseline. Efforts are underway to streamline how NSF procures and utilizes telecommunications services (including mobile devices). NSF has also reduced the cost of light refreshments in support of conferences and panels.</p>	
<p><i>Identify opportunities to streamline processes and cut costs where it can in order to send a clear message to its employees and stakeholders that strong, sound management practices are being applied, reasonable ideas to reduce spending are welcome and will be implemented; and that NSF is a responsible steward of the public’s funds.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> • Merit Review Business Practice <ul style="list-style-type: none"> ○ By investing in expanded training for panel moderators and providing other technical and human resources to support the use of virtual meeting technology on a larger scale, in 2015 NSF was able to further expand its use of virtual panels as a review mechanism for small groups of proposals. From the results to-date, it is projected that at least 25 percent of proposals competitively reviewed in FY 2015 will be reviewed by virtual panels instead of face-to-face panels or purely ad hoc review. Benefits realized have included a reduction in the average time commitment necessary from individual panel reviewers and a reduction in NSF’s expenditure on panelists’ travel. ○ The Graduate Research Fellowship Program switched from using in-person panels to virtual panels for its annual review of fellowship applications. This replaced a process that in FY 2013 brought approximately 800 reviewers to DC for in-person panels, held simultaneously in a hotel conference venue, with virtual meetings that collectively involved 1,200 reviewers. Although this required increased DIS expenditures and additional DAS staff support, these were offset by savings in travel costs. The virtual meeting approach also made it possible for more reviewers to participate and enabled the program to raise the minimum number of reviews per application from the two to three. • Travel: Issued FY 2015 travel targets (January 2015) to promote and monitor achievement of the \$3.9 million reduction goal established in response to OMB Memorandum M-12-12; which requires that agencies must maintain the reduced level of travel

	<p>spending each year through FY 2016. By the third quarter of FY 2015, NSF had realized savings totaling \$8.4 million – a reduction of 32 percent below FY 2010 travel obligations. Savings have been achieved across most travel categories, but the key driver is reduced travel costs associated with merit review panels.</p> <ul style="list-style-type: none"> ○ NSF held 27 percent of merit review panels wholly virtually through third quarter of FY 2015. As a result, comparing through the third quarter of each fiscal year since 2010, spending on panel travel was reduced by \$5.9 million—a reduction of 50 percent below FY 2010. ○ The use of non-refundable airline tickets continued to be encouraged for meetings required by the Federal Advisory Committee Act (panels, advisory committee meetings, committees of visitors). Airline tickets savings totaled \$774,700 through the third quarter of FY 2015. ○ Conferences: Continued the policy (set forth in NSF Bulletin No. 12-19) to ensure that all conference costs are appropriate, necessary, and managed in a way that minimizes expenses. This policy established requirements related to conference planning, approval, and reporting. To ensure full transparency to the public of the agency’s major conferences, published the NSF OMB M-12-12 Annual Report – FY 2014 on the NSF public website. This report provided details on conferences hosted by NSF that cost over \$100,000. Continued enforcing the conference reporting and notification requirements set forth in Section 739 of the 2015 Appropriations Act (P.L. 113-235). Compiled information on NSF-sponsored conferences costing over \$100,000 in order to prepare the required annual report and ensure consistency with conferences tracked under the NSF Bulletin No. 12-19 approval process. Provided reports to the OIG on conferences costing over \$20,000 to meet notification requirements of Section 739. ○ Continued utilization of the Blanket Purchase Agreements associated with the light refreshment program for on-site panel and advisory committee meetings, leading to continued lower costs for the program as compared to previous fiscal years. <ul style="list-style-type: none"> ● Printing: Currently developing a comprehensive Managed Print Services Strategy based on current market research and on the cost-benefit analysis previously prepared. This strategy consists of several key components that directly address management challenges as it relates to printing, and includes reducing the total number of printing devices, manufacturers, and models. The strategy intends to centralize the approval, acquisition, and maintenance of all NSF printing devices within OIRM. ● Telecommunications: In FY 2014, NSF initiated a pilot for the use of Telecommunications Expense Management Services (TEMS) in four directorates and offices. Since the pilot began, NSF has expanded the use of TEMS services to additional directorates, with 100 percent NSF participation completed in FY 2015. NSF is in the process of determining TEMS program savings to date. ● IPA Costs: Continued to monitor and implement the corrective action plan associated with the OIG report on the “Audit of Costs Associated with NSF’s Use of Intergovernmental Personnel Act (IPA) Assignees.” Initiated actions will balance the potential for costs savings with the operational risks of incorporating strategies to lower costs. Actions taken in FY 2015 include: 1) developed a document describing the benefits to institutions for allowing their staff to come to NSF as IPAs, to be used when requesting cost sharing, 2) reached the highest percentage of IPA awards with cost sharing ever achieved; more than 40% of all active agreements have cost sharing, which is double the rate in previous years, and 3) incorporated data on IPAs and their costs in the HRStat dashboard and quarterly review process and initiation of a summary annual report. <p>NSF’s Anticipated Next Steps</p> <ul style="list-style-type: none"> ● Conferences:
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	<ul style="list-style-type: none"> ○ Continue to monitor per person costs of light refreshments purchased for on-site panel and advisory committee meetings. ○ Continue to follow the conference planning, approval, and reporting requirements established to minimize the cost of conferences hosted and attended by NSF. ● Printing: Garner buy-in for the Managed Print Services Strategy from NSF senior management with a plan to begin execution such that a complete implementation will coincide with the agency’s relocation to Alexandria, VA. ● Telecommunications: Work towards fully optimized mobile device plans across the Foundation through use of the TEMS contract. Confirm yearly savings with all NSF organizations using TEMS for a full fiscal year. ● IPA Costs: NSF will continue to look at minimizing IPA costs in the areas of expanded telework (including development of guidelines on combining Independent Research and Development (IR/D) Travel and telework as well as piloting remote duty assignments) and cost sharing of IPA salaries with universities, balancing the potential for costs savings with the operational risks of incorporating strategies to lower costs. NSF will review the overall IPA program and associated costs and benefits every four years strategies to lower costs.
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CHALLENGE: Encouraging the Ethical Conduct of Research

NSF Overview: The responsible and ethical conduct of research is critical to ensure excellence, as well as public trust, in science and engineering. Moreover, the globalization of science and engineering research and education poses unique challenges and risks due to variations in international codes of conduct. Recognizing the importance of ethical conduct of research and in accordance with the America COMPETES Act of 2009 (ACA), NSF requires that each institution submitting a proposal certify that it has a plan to provide appropriate training and relevant oversight in the ethical conduct of research to all undergraduates, graduate students, and postdoctoral researchers who will conduct NSF-sponsored research and to have the plan available for review upon request. Research on the topic is meagre with conflicting conclusions. Thus, current ethics training may only be having a modest impact and the traditional focus on the responsible conduct of research is overly narrow because there are many other equally important ethical dimensions of STEM research and practice. NSF implementation of ACA promotes awareness of ethical issues to NSF staff, as well as U.S. and international scientific research and education communities. In addition, research ethics are addressed in policy guidance, incorporated into program funding opportunities, and emphasized through the development of resources to enhance the ability of research institutions to cultivate cultures of academic and research integrity.

<p><i>To provide oversight on institutional implementation of Responsible Conduct of Research (RCR) and to provide meaningful guidance regarding RCR training.</i></p>	<p>NSF’s Significant Actions Taken in FY 2015</p> <ul style="list-style-type: none"> ● Managed the Cultivating Cultures for Ethical STEM (CCE STEM) program. CCE STEM “focuses on cultivating climates that expect and encourage academic and research integrity at all levels. Rather than focusing on curriculum development, the focus of the new program is to identify factors that are effective in creating climates that foster integrity.” ● Oversaw year 1 of the 5-year cooperative agreement with the National Academies to develop their Online Ethics Center to include material relevant to all fields that NSF supports. This award plans to develop a cohort of international collaborators to collect new ideas and best practices from international sources about ethics and social responsibility in research and education, and expertise in developing policies and codes of ethics for STEM faculty, students, and practitioners. ● Organized a NSF-Japan Society for the Promotion of Science Collaborative Workshop on research integrity in Japan in the aftermath of a large research misconduct scandal that occurred in 2014 in Japan. Participated in two AAAS workshops with Chinese delegations on research integrity.
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	<ul style="list-style-type: none">• Sponsored cross-directorate workshop on September 10, 2015, entitled "Reproducible, Reliable Science," highlighting the value of replicability in science.• Detailed a science-based program officer to OIG to assist with a proactive review of the implementation of NSF's RCR policy at a sample of awardee institutions.
	<p>NSF's Anticipated Next Steps</p> <ul style="list-style-type: none">• Continue to support research that provides answers to questions about creating responsible research communities.• Continue to share state-of-the-art understanding of what approaches are most effective in outreach opportunities with NSF staff, and with U.S. and international scientific research and education communities.• Identify and develop funding mechanisms to support reproducible and reliable science.

Freeze the Footprint

NSF is scheduled to move to new headquarters in Alexandria, Virginia by December 2017. The General Services Administration (GSA) negotiated new leases for NSF’s current primary office spaces, Stafford Place I and II, to allow time for the new NSF headquarters to be built and made ready for occupancy. Because NSF will be moving to a new facility, the agency cannot make any major investments in the current headquarters space to renovate and create new and more flexible work spaces to accommodate demands for staff growth and meeting spaces, as there would not be enough time to realize a return on the investment. NSF will continue to work with its facilities team to ensure maximum utilization of the current space available. Additionally, the new lease rates in Alexandria will be lower than the current lease rates in Stafford Place I and II.

NSF has dedicated a significant effort to planning for its new headquarters, which will take the agency 15 years into the future. This forward-looking effort is incorporating the most creative thinking in terms of flexible workspaces, functionally-based office and workspace standards, virtual technologies, cloud computing, and alternate work styles that will allow the agency to increase in staff numbers but not in real estate footprint.

Freeze the Footprint Baseline Comparison			
<i>Square Footage</i>	<i>FY 2012 Baseline</i>	<i>2014</i>	<i>Change (FY 2012 – 2014)</i>
NSF Occupancy Agreements	581,455	616,998	35,543
Grantee Assets	611,089	610,491	-598
<i>Total</i>	<i>1,192,544</i>	<i>1,227,489</i>	<i>34,945</i>

Note: Preliminary information, pending verification by GSA.

Undisbursed Balances in Expired Grant Accounts

In FY 2015, NSF funded research and education in science and engineering through grants and cooperative agreements to 1,859 colleges, universities, and other institutions. NSF grants are funded in one of two ways: 1) the grant may be funded fully at the time of award, called a standard grant, or 2) the grant may be funded incrementally (one year at a time), called a continuing grant. In both cases, all costs on the grant must be incurred by the grantee during the term of the grant period. At NSF, grantees typically have 120 days after the grant expires to complete final drawdowns and expenditures. In prior years, NSF grantees had 90 days to complete final drawdowns and expenditures. The period was changed during January 2015 from 90 to 120 days in response to many comments NSF had received from the grantee community.

The information provided here pertains to the agency's two grant making appropriation accounts: Research and Related Activities (R&RA) and Education and Human Resources (EHR). The data reported are based on the following definitions:

- An **expired grant** is a grant award that has reached the grant end date and is eligible for closeout. For NSF, this means grants whose period of performance has expired.
- **Undisbursed balances on expired grants** represent the unliquidated obligation amounts that remain available for expenditure on an expired grant award before it is closed out.

Once a grant has expired, NSF takes actions to close out the grant both administratively and financially. The financial closeout action takes place 120 days after the award expiration date when the undisbursed balances are de-obligated from the award. Administrative closeout is initiated after financial closeout is completed.

The methodology used to develop undisbursed balances on expired grant awards is consistent with the U.S. Government Accountability Office (GAO) conclusions documented in their April 2012 report, GAO-12-360, *Grants Management: Action Needed to Improve the Timeliness of Grant Closeouts by Federal Agencies*, along with discussion and clarifying information from GAO. The data reported here reflects the amount of undisbursed balances in grant accounts that have reached their end date and are eligible for closeout.

1. Details on future action the department, agency, or instrumentality will take to resolve undisbursed balances in expired grant accounts.

NSF continually monitors its grant awards throughout their lifecycle following a comprehensive post-award monitoring process. NSF grants are closed based on their period of performance end date. 120 days after the grant period has expired, all unliquidated (or undisbursed) award balances are de-obligated. Having small undisbursed balances at the end of the grant period is a routine occurrence, as not all grantees fully spend all of the funds obligated in the course of their research.

2. The method that the department, agency or instrumentality uses to track undisbursed balances in expired grant accounts.

NSF completes financial closeout of expired grant awards on a daily basis using a set of automated and manual activities. Eligibility for closeout for all NSF awards begins 120 days after the award expiration date. The NSF closeout process automatically de-obligates any unliquidated (unspent) award balance,

Appendix 5: Undisbursed Balances in Expired Grant Accounts

produces an award closeout transaction to flag the award as financially closed, and sends the financial closeout date to NSF’s award management system. This initiates final administrative closeout procedures in the award management system.

The expected award closeout date is made available to awardees and staff through the Award Cash Management Service (ACM\$). ACM\$ requires the submission of award level payment amounts and expenditures each time funds are requested by awardees and allows NSF to complete post-award monitoring at the individual award level throughout the lifecycle of the award.

3. Identification of undisbursed balances in expired grant accounts that may be returned to the Treasury of the United States.

When a grant is closed out, the unliquidated (or undisbursed) balances are de-obligated. The de-obligated grant balances are treated one of three ways:

- If the source appropriation is still active, the balances are recovered by NSF and remain available for valid new obligations until the source appropriation’s expiration date.
- If the source appropriation has expired but funds have not yet been canceled, the grant balances are recovered by NSF and remain available for upward adjustments on other existing obligations within the source appropriation.
- If the source appropriation has been canceled, the grant balances are returned to the Treasury.

At 2015 fiscal year end, there were no grants that had to be canceled. All undisbursed balances in canceling grant accounts were de-obligated prior to fiscal year end. These grant balances will be returned to Treasury.

4. In the preceding three fiscal years, details on the total number of expired grant accounts with undisbursed balances (on the first day for each fiscal year) for the department, agency, or instrumentality and the total finances that have not been obligated to specific project remaining in the accounts.

The number of expired grants with undisbursed balances for the preceding three fiscal years is provided in the table below. These numbers and balances reflect a point in time before they are closed out in our normal processes described above. The table shows that for FY 2015, there were 4,406 expired grants with undisbursed balances of \$72,275,377.

Status of Undisbursed Balances in Expired Grants				
	FY 2015 (as of 9/30/15)	FY 2014 (as of 9/30/14)	FY 2013 (as of 9/30/13)	FY 2012 (as of 9/30/12)
Number of expired grants	4,406	4,295	6,556	7,986
Undisbursed balances prior to closeout	\$72,275,377	\$72,612,661	\$118,371,186	\$184,489,992

Awards to Affiliated Institutions

This table lists the institutions affiliated with members of the National Science Board (NSB) in FY 2015.

Affiliated Institution ¹	Awards Obligated in FY 2015 (\$ in thousands)
American Association for the Advancement of Science	\$ 10,448
Arizona State University	71,668
California Institute of Technology	73,022
Cornell University	100,891
Georgetown University	4,667
Georgia Institute of Technology	82,233
Illinois Institute of Technology	5,482
Massachusetts Institute of Technology	93,972
Princeton University	66,892
Purdue University	71,943
Stanford University	78,768
Tufts University	8,962
University of California – Berkeley	113,125
University of California – Davis	47,803
University of Chicago	56,252
University of Colorado	83,516
University of Michigan	100,046
University of Oklahoma	17,004
University of Oregon	14,157
TOTAL	\$ 1,100,851

¹ This table is provided solely in the interest of openness and transparency. NSB establishes the policies of NSF within the framework of applicable national policies set forth by the President and Congress. Federal conflict of interest rules prohibit NSB members from participating in matters where they have a conflict of interest or there is an impartiality concern without prior authorization from the designated agency Ethics Official. Individual NSF grant awards are made pursuant to a peer-review based process and most are not reviewed by the Board. With regard to matters that are brought to the Board, NSB members are not involved in the review or approval of grant awards to their affiliated institutions.

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 1,279 NSF invention disclosures reported to NSF either directly or through NIH's iEdison database during FY 2015. 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

AAAS	American Association for the Advancement of Science	EHR	Education and Human Resources
ACA	America COMPETES Act of 2009	EIS	Enterprise Information System
ACM\$	Award Cash Management Service	FASAB	Federal Accounting Standards Advisory Board
AFGE	American Federation of Government Employees	FBWT	Fund Balance with Treasury
AFR	Agency Financial Report	FECA	Federal Employees' Compensation Act
AIMS	Antarctic Infrastructure Modernization for Science	FERS	Federal Employees Retirement System
AOAM	Agency Operations and Award Management	FFATA	Federal Funding Accountability and Transparency Act of 2006
APR	Annual Performance Report	FFMIA	Federal Financial Management Improvement Act of 1996
AREV	Advanced Revelation	FFR	Federal Financial Report
ARRA	American Recovery and Reinvestment Act of 2009	FFRDC	Federally Funded Research and Development Center
ASC	Antarctic Support Contractor	FISMA	Federal Information Security Management Act of 2002
BFA	Office of Budget, Finance and Award Management	FMFIA	Federal Managers Financial Integrity Act of 1982
BOC	Budget Object Class	FSIP	Federal Service Impasses Panel
BRP	Blue Ribbon Panel	FTE	Full-Time Equivalent
BSR	Business System Review	FY	Fiscal Year
CAAR	Cost Analysis and Audit Resolution (Branch)	GAAP	Generally Accepted Accounting Principles
CAP	Cross-Agency Priority (Goal)	GAO	Government Accountability Office
CAS	Cost Accounting Standards	GEO	Directorate for Geosciences
CCE STEM	Cultivating Cultures for Ethical STEM	GMRA	Government Management Reform Act of 1994
CDR	Conceptual Design Review	GPRA	Government Performance and Results Act of 1993
CFO	Chief Financial Officer	GSA	General Services Administration
COFAR	Council on Financial Assistance Reform	H-1B	Non-immigrant Petitioner Fees Accounts
COI	Conflict of Interest	IBC	Interior Business Council
COSO	Committee of Sponsoring Organizations of the Treadway Commission	IBNR	Incurred but Not Reported
COTS	Commercial Off-the-Shelf	ICASS	International Cooperative Administrative Support Services
CPARS	Contractor Performance Assessment Reporting System	ICQA	Internal Control Quality Assurance
CSRS	Civil Service Retirement System	IG	Inspector General
DAEO	Designated Agency Ethics Official	IPA	Intergovernmental Personnel Act
DACS/CSB	Division of Acquisition and Cooperative Support, Cooperative Support Branch	IPIA	Improper Payments Information Act of 2002
DAS	Division of Administrative Services	IPERA	Improper Payments Elimination and Recovery Act of 2010
DATA	Digital Accountability and Transparency (Act)	IPERIA	Improper Payments Elimination and Recovery Improvement Act of 2012
DCAA	Defense Contract Audit Agency	ISCM	Information Security Continuous Monitoring
DD	Division Director	K-12	Kindergarten to Grade 12
DHS	Department of Homeland Security	LFO	Large Facilities Office
DIS	Division of Information Systems	LIGO	Laser Interferometer Gravitational-Wave Observatory
DMF	Social Security Administration's Death Master File	LRM	Linear Regression Model
DNP	Do Not Pay	LRO	Labor Relations Officer
DOL	Department of Labor		
DRB	Director's Review Board		
EEO	Equal Employment Opportunity		

LSST	Large Synoptic Survey Telescope
MREFC	Major Research Equipment and Facilities Construction
NARA	National Archives and Records Administration
NEON	National Ecological Observatory Network
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NSB	National Science Board
NSF	National Science Foundation
OIG	Office of Inspector General
OIRM	Office of Information and Resource Management
OMB	Office of Management and Budget
OPM	Office of Personnel Management
PAM	Proposal & Award Manual
PD	Project Director
PLR	Division of Polar Programs
PP&E	General Property, Plant, and Equipment
R&D	Research and Development
R&RA	Research and Related Activities
RCR	Responsible Conduct of Research
RFP	Request for Proposal
RSSI	Required Supplementary Stewardship Information
S&E	Science and Engineering
SAM	GSA System for Award Management
SBR	Statement of Budgetary Resources
SFFAS	Statement of Federal Financial Accounting Standards
SOS	Schedule of Spending
SSAE	Statement on Standards for Attestation Engagements
SSP	Shared Service Provider
STEM	Science, Technology, Engineering, and Mathematics
TAWG 2	Transparency and Accountability Working Group
TEMS	Telecommunications Expense Management Services
UGG	Uniform Grant Guidance
USAP	United States Antarctic Program
USSGL	U.S. Standard General Ledger