

FY 2018 MANAGEMENT CHALLENGE PROGRESS REPORT

Background

Under the Reports Consolidation Act of 2000, NSF's Inspector General is required to summarize what it considers to be the most significant management and performance challenges facing NSF in the coming year in a memo to the NSF Director. The management challenges are identified by NSF's Inspector General and announced at the beginning of each fiscal year. In response, the Director issues a memo to acknowledge receipt of the OIG Management Challenges and to provide a report on NSF's progress and achievements made over the prior year.

The OIG's challenges, NSF's response, and NSF's progress update towards addressing previously identified challenges are included in the annual Agency Financial Report (AFR) published in November on NSF's website.¹ This section provides NSF's progress report highlighting the significant actions taken in FY 2018 on the management challenges identified by NSF's Inspector General at the beginning of that fiscal year.

Enterprise Risk Management

Starting in FY 2018, NSF's Progress Report applied its Enterprise Risk Management framework to document its assessments of the inherent and residual risks for each of the OIG's Challenges for FY 2018, including actions to mitigate risks. NSF management's overview of the challenges presented represent NSF's view of the residual risk in light of the key actions NSF has already taken to address the OIG-identified challenge. Further, NSF management developed the anticipated milestones in consideration of NSF's strategic objectives, the risks inherent to NSF's work, and the key actions NSF has already taken to address those risks.

In response to NSF's incorporation of ERM principles in its FY 2018 report, the OIG updated its reporting format for FY 2019, and recognized NSF's progress by removing two Management Challenges cited for FY 2018: Management of the Government's Records and Cybersecurity and Information Technology Management. These changes in NSF's and OIG's reports enable constructive dialogue between NSF and the OIG about risk, and advance fulsome consideration by NSF of the OIG's new challenges.

FY 2018 Management Challenges

- Major Multi-User Research Facilities Management
- Business Operations Management: Improper Payments
- Business Operations Management: DATA Act
- Business Operations Management: Managing the Government's Records
- Business Operations Management: Subrecipient Monitoring
- Management of the *Intergovernmental Personnel Act* (IPA) Program
- U.S. Antarctic Program (USAP) Management
- Cybersecurity and Information Technology (IT) Management
- Encouraging the Ethical Conduct of Research

FY 2019 Management Challenges

- Managing major multi-user research facilities
- Meeting Digital Accountability and Transparency Act of 2014 (DATA Act) reporting requirements
- Eliminating improper payments
- Managing the Intergovernmental Personnel Act (IPA) Program
- Managing the U.S. Antarctic Program
- Encouraging the ethical conduct of research

¹ www.nsf.gov/about/performance

Major Multi-User Research Facilities Management

Co-Leads: Chief Financial Officer and Chief Officer for Research Facilities

Summary of OIG Identified Challenge

Ensure consistent implementation of its expanded controls for major facilities oversight.

NSF's Key Actions to Address the Challenge

Agency Actions Taken in Prior Fiscal Years

- Strengthened controls over NSF's major facility portfolio through the development of several new policies and procedures in FY 2016 and FY 2017 including: (1) retaining a portion of the recipients' contingency funds; (2) periodically conducting cost incurred audits; (3) completing a cost proposal review for reasonableness of proposed costs; (4) obtaining an independent cost review of the proposed budget; (5) conducting earned value management system verification, validation and acceptance; and (6) reviewing proposed fees and requiring recipients to track fee expenditures.
- Developed the Major Facilities A-123 Oversight Process Narrative and revised the *Large Facilities Manual* (LFM) to incorporate new guidance for recipients related to cost estimating and analysis.

Actions Taken in FY 2018

- Appointed a new Chief Officer for Research Facilities (CORF) in the Office of the Director to ensure agency-wide acceptance of policies and procedures related to oversight of major facilities.
- Appointed Accountable Directorate Representatives (ADR) in each Directorate with major facilities and formed the Major Facilities Working Group (consisting of the ADR's) to review and socialize policies and procedures related to the oversight of major facilities.
- Formed the Facilities Governance Board to approve major facility oversight policies and procedures at the agency level.
- Revised the Integrated Project Team (IPT) Standard Operating Guidance (SOG) to include facilities in the Operations Stage.
- Developed the Core Competency SOG to codify the minimum competencies for the core IPT members.
- Conducted an independent third-party review of NSF's strengthened policies and procedures related to cost surveillance.

NSF Management's Overview of the Challenge

NSF understands the importance of overseeing its recipients' management of major facility awards. The agency also recognizes the importance of assessing prospective recipients' capabilities for managing proposed awards. Over the past several years, NSF has been in the process of strengthening its policies and procedures as illustrated above. This includes an annual major facilities portfolio risk assessment to determine the necessary BFA-led reviews and audits to be conducted by the Large Facilities Office (LFO) and the Cooperative Support Branch (CSB). In close cooperation with program, LFO and CSB conduct the reviews described above, which were specifically created to safeguard NSF's investments in supporting the scientific endeavor. NSF leadership has shown its commitment to oversight in the past several years by strengthening the LFO and in establishing the new CORF position. The new governance structure now in place will help ensure consistent implementation of its expanded controls for major facilities oversight.

NSF has recently undergone a Government Accountability Office (GAO) review related to its No Cost Overrun Policy and oversight practices related to recipient cost and schedule development. In the June 2018 report entitled *National Science Foundation: Revised Policies on Developing Costs and Schedules Could Improve Estimates for Large Facilities* (GAO-18-370), the GAO recommended that NSF should revise its policies for estimating and reviewing the costs and schedules of large facilities projects to better incorporate

the best practices in GAO's guides. NSF agreed with the GAO recommendations and has a corrective action plan in place to address the findings.

Based on NSF's risk-based evaluation of this Management Challenge, coupled with activities already completed and those planned for FY 2019, NSF has determined that the residual risk impact is "very low" and the likelihood is "low." NSF is confident that its current and planned policies and procedures related to major facility cost and schedule oversight adequately consider and balance risk, resources, and stewardship of federal funds.

NSF's Anticipated Milestones

- Anticipate receipt of independent third-party report related to cost surveillance – Q1 FY2019.
- Finalize Selection of Independent Cost Estimate Review SOG already implemented in practice – Q1 FY2019.
- Describe the purpose and customary methods for sensitivity analysis and application of GAO's 12 steps of a high-quality cost estimating process (LFM Section 4.2) – Q3 FY 2019.
- Finalize and align BFA SOGs related to selection of independent cost estimate reviews, standardized cost analysis, and pre-award budget reviews to specifically address American Innovation and Competitiveness Act requirements and GAO good practices – Q4 FY 2018.
- Develop and implement a new Major Facilities Review SOG to more fully utilize external review panels in addressing elements of cost and schedule – Q2 FY 2019.
- Create a new LFM Section 4.3, *Schedule Development, Estimating, and Analysis* – Q3 FY 2019.
- Update BFA Cooperative Support Branch's Standardized Cost Analysis Guidance SOG to include assessment of schedule due to the potential impact scheduling has on costs – Q4 FY 2018.

Business Operations Management: Improper Payments

Lead: Chief Financial Officer

Summary of OIG Identified Challenge

- (a) Ensure proper payments to awardees for the \$7 billion issued annually in grant and cooperative agreement payments without verification;
- (b) address substantial concerns with the depth, substance, and documentation of the NSF risk assessment;
- (c) address significant limitations in NSF's analysis of six of the nine OMB risk factors; and
- (d) improve assessment of NSF payments to employees.

NSF's Key Actions to Address the Challenge

Agency Actions Taken in Prior Fiscal Years

- Developed and published SOG for improper payments risk reviews incorporating the nine Improper Payment Elimination and Recovery Act (IPERA) risk factors and additional considerations from the OIG review report.
- Completed improper payments risk reviews for FY 2016 and FY 2017. The risk reviews included input from subject matter experts (SMEs) for grants, contracts, charge cards, and payments to employees. Both reviews concluded that NSF did not have a significant risk of improper payments.
- OIG inspection of the FY 2016 and FY 2017 risk reviews found NSF in compliance with IPERA requirements.

Actions Taken in FY 2018

- Conducted advanced and baseline grant monitoring activities including grant payment testing.
- Operated, evaluated, and reported on an effective internal controls program providing assurance that NSF controls over grant and grant payment processes are properly designed and operating effectively.
- Collaborated with the OIG, BFA, and program offices on risk reduction activities including completion of an initial fraud risk assessment for grants under the Fraud Reduction and Data Analytics Act.
- Completed an improper payments risk assessment for FY 2018 that built on the improper payments risk reviews completed during FY 2016 and FY 2017.

NSF Management's Overview of the Challenge

NSF appreciated the OIG's current determination of NSF's compliance with IPERA and closure of all recommendations from the previous OIG reports. The reports clearly validate that NSF has taken the steps necessary to demonstrate compliance and effectiveness in the agency's implementation of IPERA because NSF has:

- Demonstrated strong commitment and top leadership support to incorporate risk management concepts into business processes and management functions;
- Ensured that NSF has the people and resources to effectively comply with IPERA by assigning a senior staff associate responsible for coordinating and integrating risk management and program integrity activities;
- Developed and completed a corrective action plan in July 2016 that addressed the root causes of the IPERA reporting issue, implemented solutions, and completed all OIG recommendations;
- Established processes to monitor and validate the effectiveness and sustainability of the corrective measures; and
- Incorporated corrective measures into policy and process documentation.

NSF's Anticipated Milestones

- Continue advanced and baseline grant monitoring activities including grant payment testing.
- Continue internal controls program activities to provide assurance that NSF controls for its payment processes are operating effectively.
- Continue collaboration with the OIG on risk reduction activities.
- Continue to improve improper payments risk assessment and reporting compliance activities.

Business Operations Management: DATA Act

Lead: Chief Financial Officer

Summary of OIG Identified Challenge

Address challenges set forth in OIG audit report 18-2-001, dated November 17, 2017, reporting on the OIG's assessment of completeness, timeliness, quality, and accuracy of data submitted by NSF in accordance with the DATA Act.

NSF's Key Actions to Address the Challenge

Actions Taken in FY 2018

Developed and implemented Corrective Action Plan in response to the FY 2017 audit with the following actions:

- Examined processes identified as potential audit risks, identified ways to improve or strengthen the processes, and documented changes in NSF's standard operating procedures.
- Submitted corrections for any data errors identified in the audit.
- Included comments with NSF's submissions to explain legitimate differences between File C (Award and Financial Detail) and Files D1/D2 (Financial Assistance and Procurement Award and Awardee Attributes).
- Reviewed submission process with the internal controls team and identified opportunities for improvement.
- Performed policy review of the application of "legitimate differences" guidance to warnings when linking Files C to D1/D2.
- Worked closely with the DATA Act Audit Collaboration Working Group of the CFO Council (CFOC) and the Council of the Inspectors General on Integrity and Efficiency (CIGIE) to identify issues to be addressed to improve DATA Act implementation and clarify government-wide guidance and audit standards.
- Worked with a subgroup of the Financial Assistance Committee for E-Government (FACE) in collaboration with a DATA Act Internal Control subgroup of the CFOC to provide a solid framework and data quality plan template that agencies can leverage and customize to develop their own data quality plans.
- Initiated implementation of OMB Circular A-123 Appendix A, requiring agencies to maintain a Data Quality Plan that considers the incremental risks to data quality in federal spending data and any controls that would manage such risks. NSF's data quality plan will leverage the existing plans for the Financial (Files A-C) and Procurement (File D1) data as well incorporate the new data quality requirements for the Financial Assistance (File D2) data.
- Reviewed SharePoint processes to ensure all required BFA Division Director validations are complete, properly labelled, and available for Senior Accountable Official (SAO) review.

NSF Management's Overview of the Challenge

The Digital Accountability and Transparency Act (DATA Act) is a government-wide initiative led by OMB and the U.S. Department of Treasury (Treasury) to standardize and publish the federal government's wide variety of reports and data compilations related to spending: financial management, payments, budget actions, procurement, and assistance. On April 28, 2017, NSF successfully met the DATA Act's requirement for federal agencies to begin submitting data to Treasury. From the outset, NSF prioritized DATA Act implementation, initially naming an SAO from the Office of the Director and later transitioning that role to the NSF Chief Financial Officer where it remains. The agency allocated appropriate resources to both the implementation and operations phases of its DATA Act work, leveraging agency staff from BFA and OIRM as well as contract resources. Early on, NSF recognized the importance of government-

wide engagement and earned the Treasury Secretary's Certificate of Appreciation in recognition of NSF's outstanding commitment to collaboration on this government-wide implementation challenge.

The DATA Act required the OIG of each federal agency to review a sample of the financial data submitted by the agency and report on its completeness, timeliness, quality, and accuracy, as well as the implementation and use of consistent data standards by each agency. The NSF OIG issued its report on November 17, 2017. NSF generally agreed with the audit recommendations and has addressed them all, developing corrective actions that have been resolved and closed by the OIG. In connection with this work, NSF staff conducted a root cause analysis of its challenges, noting that many of the OIG-identified errors were government-wide in nature and beyond NSF's control, which the OIG recognized in its report.

Among the corrective actions NSF has implemented is the agency's continued leadership and engagement in government-wide DATA Act-related work. On June 6, 2018, OMB issued new guidance, Appendix A of OMB Circular A-123, superseding prior DATA Act guidance and creating a requirement for agencies to develop data quality plans that include management assurance in the quality of its data. NSF analysis confirmed that the prior guidance had dramatically amplified NSF error rates because auditors relied on it to evaluate errors at the transaction level, rather than at the data element level. Agencies will now be audited against the revised approach, and NSF is confident that the agency's reported error rate will drop significantly as a result.

NSF's progress on the DATA Act has been enabled by the NSF Deputy CFO's deep engagement in supporting the activities relating to the Audit Collaboration Working Group of the CFOC and CIGIE, which will develop agency best practices for implementing the new guidance. The CFOC is also collaborating with GAO and CIGIE as they develop their related audit guidance, which will take the new OMB guidance into account. In addition, the NSF Division Director for BFA's Division of Institution and Award Support and other NSF senior staff are supporting the government-wide financial assistance community's work to develop a framework for the required data quality plans, which NSF will leverage as it prepares its own required plan.

Based on NSF's risk-based evaluation of this Management Challenge, along with the causes analyzed and actions that NSF has taken to date, NSF believes that its risk of reporting inaccurate, incomplete, and untimely data has been significantly reduced.

NSF's Anticipated Milestones

- Participate in government-wide working groups to develop a DATA Act Playbook to support federal agencies' compliance and audit readiness;
- Develop an NSF DATA ACT data quality plan; and
- Monitor changes to NSF systems to determine impact on DATA Act reporting.

Business Operations Management: Managing the Government’s Records

Lead: Office Head, OIRM

Summary of OIG Identified Challenge

(a)	(b)	(c)
Ensure compliance with the National Archives and Records Administration’s (NARA) August 24, 2012, Managing Government Records Directive (M-12-18) to take specific actions to reform records management policies and practices by appointed dates.	Continue initiatives to reduce the amount of paper, supplies and equipment that NSF uses and stores given less office space available in the new NSF headquarters as well as efficiently and effectively manage the scanning/digitization effort to reduce the amount of paper.	Provide updated records management training to staff in accordance with NARA Bulletin 2017-01 (Agency Records Management Training Requirements).

NSF’s Key Actions to Address the Challenge

Agency Actions Taken in Prior Fiscal Years

- Verified and validated the accuracy of the report on records that were 30-years old or more and determined there are no records meeting this criterion in existence within the agency. (October 2015)
- Conducted a review of records at the Federal Records Center (FRC) locations where agency records are stored and determined that no unscheduled records remain there. (October 2015)
- Began presenting an overview of general records management responsibilities at NSF’s New Employee Orientation sessions. (August 2017)
- Revised NSF records management training course to cover all NARA-required elements. (June 2017)
- Scanned over 7,000 permanent and temporary records from August 2016 to August 2017 during the process of relocating to the new NSF headquarters as part of an agency-wide “green” initiative to eliminate paper and property. The initiative ultimately reduced 1,200,000 pounds of paper and property, compared to a goal of 500,000 pounds.

Actions Taken in FY 2018

(a)	(b)	(c)
<ul style="list-style-type: none"> • Issued NSF Bulletin 18-05, Records Management Program, and NSF Bulletin 18-04, Managing Records in Electronic Messages, to identify staff responsibilities at all levels of the agency. • Issued guidance for executing NSF’s Capstone Officials’ Email Management Program under Bulletin 18-03. • Issued NSF Bulletin 18-12, Managing Email of Supervisory, Support and/or Administrative Personnel as Records • Classified OIG and Office of the General Counsel’s electronic records as official records. • Completed an analysis of records at the FRC. • Implemented blacklist capability on NSF-managed mobile devices to prohibit restricted application downloads. 	<ul style="list-style-type: none"> • Implemented a full-text search capability in the Electronic Records Management System (ERMS). • Created an online training for the ERMS. 	<p>Issued NSF Bulletin 18-06, Required Records Management Training, to implement new requirement for all staff to take annual records management training. New personnel on boarding after April 30, 2018 are required to complete the course within 60 days of employment and annually each fiscal year thereafter. All other personnel are required to complete this course by September 30, 2018, and annually each fiscal year thereafter.</p>

<ul style="list-style-type: none"> • Issued updated NSF Bulletin 18-07, Mobile Communications Devices, to include guidance related to electronic records on NSF-issued smartphones. • Updated mobile device rules of behavior to comply with NSF Bulletin 18-07. • Added instructions to the agency’s standard operating procedures (SOP) for social media on how to capture and retain records in social media posts on NSF accounts. 		
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NSF Management’s Overview of the Challenge

NSF is on track to comply with NARA’s 2012 directive (M-12-18) to take specific actions by appointed dates to reform the policies and practices for the management of government records. The agency has committed appropriate resources to prioritize its compliance and has already met the requirements for Goal 2 in the 2012 directive. NSF’s anticipated milestones focus on completing the requirements for Goal 1 and ensuring it maintains compliance with Goal 2. The Foundation has worked closely with senior management and the OIG to formulate corrective action plans that outlined many of the actions taken in FY 2018 and to be taken in the future. Actions taken to-date have significantly reduced the inherent risk, such as non-compliance and lost records, to a low level.

The NSF digitization project in preparation for the move to Alexandria was a great success. Multiple offices around the building not only reduced their paper footprint to fit into their new space, but now have excess storage capacity they are looking to repurpose. Among other benefits, NSF’s above-described actions reduced the inherent risk associated with paper records, including space limitations and loss of records; therefore, the agency plans to continue to promote digitization of paper records.

NSF records management training content and policy complies with NARA Bulletin 2017-01. Formalized, required records management training will promote transparency and accountability in the management of federal records. NSF implementation of this training has addressed the inherent risk set forth in the OIG’s management challenge, bringing the residual risk to a low level. Agency progress in this area is demonstrated by the results of the NARA on-site assessment conducted in May 2018 where NARA reviewed NSF’s Records Management Training Program and policies related to records management. Senior staff within the NSF Division of Administrative Services Records Management Section were engaged with NARA and demonstrated the new *Records Management for Everyone and eRecords Management System* online training courses. NARA reviewed five recently issued records management-related NSF Bulletins. At the end of the assessment, NARA praised the training modules and bulletins, and said they would like to highlight NSF’s records management program as a model for the federal government.

NSF’s Anticipated Milestones

(a)	(b)	(c)
<ul style="list-style-type: none"> • Update remaining records schedules to classify electronic records as official agency records and get approval from the Archivist of the United States by the end of FY 2019. • Issue a policy on managing email of supervisory, support, and administrative personnel as records by December 2018. 	<ul style="list-style-type: none"> • Destroy all records at the FRC that have met their disposition date by the end of FY 2018. • Complete an agency-wide records inventory by November 2018. 	<ul style="list-style-type: none"> • Monitor compliance with annual records management training requirement for staff utilizing LearnNSF automatic tracking capability.

Performance

<ul style="list-style-type: none">• Complete the NARA 2019 Annual Records Management Self-Assessment, the Annual Federal Email Management Report, and the Annual Senior Agency Official for Records Management Report by April 2019.• Implement a tool for automated capture of text messages on NSF-managed mobile devices by November 2018.	<ul style="list-style-type: none">• Continue to scan records to put in ERMS.	<ul style="list-style-type: none">• Initiate quarterly workshops for NSF-wide Division Records Custodians by December 2018.
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Business Operations Management: Subrecipient Monitoring

Lead: Chief Financial Officer

Summary of OIG Identified Challenge

Transparency and oversight of NSF funds passed through to subrecipients (e.g. ensure awardees review sufficient cost information to demonstrate that subrecipients' costs are allowable, fair, and reasonable).

NSF's Key Actions to Address the Challenge

Actions Taken in FY 2018

- Piloted a Targeted Review Assessment (TRA) methodology to assess compliance with prime awardee oversight of subrecipients.
- Reviewed NSF's Advanced Monitoring Program subaward module assessment protocols based on TRA findings and *Uniform Guidance* requirements.
- Continued to require prime awardees to take corrective actions for findings related to subaward monitoring.
- Continued practice of applying 1 to 5 risk points to awards containing subawards at or exceeding \$100,000 as part of NSF's annual risk assessment process.
- Updated the standard NSF budget form to eliminate awardee confusion around subcontracts vs. subawards. The form now only allows for subawards.
- Changed award notification language to reflect subaward vs. subcontract.
- Updated NSF's fact sheet on subrecipient monitoring to reference requirements in 2 CFR §200.331 for pre- and post-award monitoring.

NSF Management's Overview of the Challenge

Historically, NSF has understood the importance of overseeing its recipients' management of large and multiple subawards. The Foundation also recognizes the importance of assessing prospective awardees' capabilities for managing proposed subawards. NSF currently has in place a risk-based approach to oversee its award recipients' subaward management through advanced monitoring activities, including Advanced Monitoring Site Visits, Desk Reviews, and Business Systems Reviews (BSRs). NSF leadership has shown its commitment to oversight for nearly two decades by the establishment and continued support for the Division of Institution and Award Support (DIAS) and the Large Facilities Office (LFO) within NSF's Office of Budget, Finance, and Award Management. These offices were specifically created to safeguard NSF's investments in science and conduct the reviews described above. NSF also assesses risk related to subaward monitoring during its pre-award reviews, specifically for proposals of \$10M and greater. Advanced pre-award reviews are handled by expert cost analysts within DIAS, and NSF also utilizes expert advice of outside sources as warranted.

NSF has recently undergone an OIG audit of the agency's monitoring of recipients managing subawards. The OIG stated that "in most cases, NSF's processes for monitoring grantees were sufficient to ensure that pass-through entities monitored subrecipients properly." The audit report recommended that NSF strengthen several policies and procedures to better align with the *Uniform Guidance* (2 CFR § 200) as it relates to subrecipient compliance. NSF agreed with all OIG recommendations, has already acted on several issues, and intends to take additional actions to address all recommendations in the audit report pursuant to a corrective action plan.

Based on NSF's risk-based evaluation of this process, coupled with the extensive OIG audit of this area, NSF believes that the residual risk to the agency is low and is consistent with NSF's low risk appetite for misuse of funds and non-compliance with reporting and performance requirements. NSF is confident that its current pre- and post-award processes adequately consider and balance risk, resources, and stewardship.

Performance

NSF's Anticipated Milestones

- Revise DIAS's Subrecipient Review module to require review of awardee compliance with 2 CFR § 200.331 by October 2018.
- Revise the DIAS Over-\$10M SOG to align with 2 CFR § 200 as it relates to the agency's responsibility to oversee its prime recipients managing subawards by October 2018.
- Revise the BSR Guide to align with 2 CFR § 200 as it relates to the agency's responsibility to oversee its prime recipients managing subawards by November 2018.
- Revise the Large Facilities Manual to align with 2 CFR § 200 as it relates to the agency's responsibility to oversee its prime recipients managing subawards by June 2019.
- Revise the "DACS/CSB Standardized Cost Analysis Guidance" to align with 2 CFR § 200 as it relates to the agency's responsibility to oversee its prime recipients managing subawards by September 2018.

Management of the IPA Program

Co-Leads: Assistant Director, BIO and Office Head, OIRM

Summary of OIG Identified Challenge

(a)	(b)	(c)	(d)
Because individuals can serve in a temporary capacity for up to four (4) years, there is frequent turnover in staff at NSF, especially in senior leadership positions.	The amount of time IPAs spend on Independent Research/Development (IR/D) at their home institution raises concern about the ability of IPAs to fulfill their responsibilities at NSF and to be fully engaged in the agency’s mission.	NSF’s reliance on IPA’s comes at an added cost because IPAs are not subject to Federal pay and benefits limits. The American Innovation and Competitiveness Act (AICA) requires a report on NSF’s efforts to control costs associated with IPAs.	NSF could strengthen some of its internal controls to improve NSF’s ability to identify and or mitigate IPA conflicts of interest.

NSF’s Key Actions to Address the Challenge

Agency Actions Taken in Prior Fiscal Years

(a)	<ul style="list-style-type: none"> – Established an ongoing culture of staff development to ensure that there is a “bench” of staff ready for developmental detail assignments in the event that there are vacancies in executive positions, to include the Federal Executive Institute (FEI), American University Executive Leadership Program, Harvard Business School Leadership Training, Individual Development Plans, and NSF Academy training activities. – Developed and implemented a new employee onboarding program, the New Executive Transition Program (NeXT) in 2009 (NSF has historically held new employee onboarding sessions that include IPAs). The NeXT program supports the onboarding of employees and IPAs transitioning into executive-level positions. The program provides a comprehensive set of tools and information to help new executives reach full performance as quickly as possible by developing executive knowledge about NSF mission, culture, organization, people, and business processes. The NeXT Program currently includes a three-day Executive Leadership Retreat and a one-day Oversight of Merit Review, which applies to most executive IPAs. NSF also offers executive coaching to help IPAs and all executives understand their new roles and navigate the Federal environment. – Instituted mandatory and optional training for Program Officers, who comprise a large proportion of IPAs, on NSF’s Merit Review process which teaches how research proposals are evaluated and how to execute the Program Officer role. There is a Merit Review Basics series (MRB I through MRB IV), and the first two modules have been required since 2011 and the remaining two are optional. NSF is in the process of changing the requirement to include all four one-day modules. There is also an optional two-day capstone workshop called the Program Management Seminar which is typically taken by a majority of Program Officers (including IPAs). – Created a parallel performance management system in 2014 for IPAs to ensure clarity in setting expectations and providing feedback on performance. – Established a knowledge transfer process in 2015, by which exiting executives can transfer key pieces of knowledge and information to incoming executives. – Implemented a required three-day supervisory training and development course in 2015 called Federal Supervision at NSF designed to assist new federal supervisors (including IPAs) in understanding their roles and all of the requirements pertaining to federal human capital management.
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	<p>– Established a Steering Committee for Policy and Oversight of the IPA Program (IPA Steering Committee) in April 2016 to serve as the primary body for considering policy on NSF’s use of IPAs, and to oversee common approaches to budgeting and implementation of the IPA program. A key responsibility of the Steering Committee is to develop and track metrics related to the use of IPAs.</p>
(b)	<ul style="list-style-type: none"> • Established an IR/D Council in October 2011 to develop and monitor internal controls related to the IR/D program, including tracking the time spent on IR/D activities. Data from these internal controls are disseminated to NSF senior management quarterly, for use in managing the IR/D program within each organization. • Developed an IR/D Guide in 2012 to clearly communicate NSF policies on the use of IR/D, including the possibility that participation in the IR/D program could be curtailed if it compromised the completion of NSF duties. • Designated IR/D experts in each Directorate/Office who receive annual training to ensure that NSF policies are implemented appropriately. • Instituted a requirement that all IR/D plans provide an explanation of how the IR/D activities enhance the requestor’s ability to perform NSF duties. • Published a revised IR/D Guide in January 2017 that includes guidance limiting NSF payment of IPAs’ IR/D travel to their home institutions to 12 trips per year. The guidance encourages IPAs to combine other NSF official business and/or telework with these trips to get the most efficient use of those travel dollars.
(c)	<ul style="list-style-type: none"> • Completed an IPA Steering Committee analysis of costs associated with the IPA program in FY 2016 and determined that the incremental cost of the program (i.e., computing the cost differential if the positions held by IPAs were instead filled with federal employees) was approximately \$5M (or 0.07% of the NSF budget). Proportionally, this cost differential only nominally increases the total IPA program costs. As part of this analysis, the IPA Steering Committee did identify opportunities for potential cost savings, and NSF in turn initiated a pilot requiring 10% cost sharing by IPAs’ home institutions of their academic-year salaries and fringe benefits (per NSF Bulletin 16-11). This pilot applies to all new IPA agreements initiated in FY 2017 and beyond, including those for executive and program level staff. Additionally, NSF eliminated reimbursement for lost consulting. • Designed and began data collection for an evaluation led by the NSF Office of Integrated Activities Evaluation and Assessment Capability to determine the cost implications associated with the 10% cost sharing pilot and the extent to which the policy change impacts NSF’s ability to recruit strong IPAs. • Received notice from the OIG closing the sole open audit recommendation related to IPA costs as a result of these efforts. Recommendation closed in February 2017.
(d)	<ul style="list-style-type: none"> • Continued to apply the same suitability, credentialing, and security vetting process for employees and IPAs alike, and to require IT security and privacy training for all employees and IPAs for physical and logical access to facilities and systems. • Continued to implement NSF’s long-standing policy with respect to statutory and perceived conflicts of interest (COIs) for staff and reviewers. Staff who manage the merit review process are required to take training on the agency’s ethics rules. These policies and requirements apply to all staff, including IPAs. • Formulated a corrective action plan in response to the OIG’s recommendations to strengthen and add to existing controls as cited in its June 2017 audit report, <i>NSF Controls to Mitigate IPA Conflicts of Interest</i>. The report concluded that NSF had “implemented internal controls to identify and mitigate IPA conflicts of interest.” • Issued a memorandum (OD 17-03) in March 2017 to all staff, including IPAs, reminding them of the importance of high ethical standards. NSF also issued a notice to supervisors in August 2017

	<p>(OD 17-17), reminding them of their ethics responsibilities, specifically the responsibility to ensure that all subordinates, including IPAs, comply with the agency’s ethics rules.</p> <ul style="list-style-type: none"> • Reviewed and updated core policies relating to IPAs in the NSF Personnel Manual. • Developed a required online ethics training module for all new employees, including IPAs.
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Actions Taken in FY 2018

(a)	<ul style="list-style-type: none"> • Conducted analysis (January 2018) on IPA years of service and found that, on average, IPA executives serve 3.1 years at NSF (January 2018) and are 3 times more likely to stay for 3-4 years compared to staff-level IPAs. Non-executives serve, on average, 2.3 years at NSF. Per OPM, the average time a career SES spends in a position is 3.4 years and non-career SES is 1.7 years.² • Engaged with the GAO on an inquiry into the turnover of IPAs. NSF embraces IPA turnover as it helps enable NSF to keep pace with rapidly changing scientific advancements. NSF makes every effort to match those changes with a continuous cycle of deep scientific expertise and strong ties to the scientific community. The short-term nature of the rotator tenure allows NSF to continuously renew and align resources to our core mission requirement to promote the progress of science.
(b)	<ul style="list-style-type: none"> • Delivered the IR/D Annual Report to NSF Deputy Assistant Directors (DADs) (November 2017) indicating, on average, 72% of IPAs participated in IR/D, down from 76% two years ago. On average, IPA IR/D plans requested 37 days of IR/D, yet only 19 days were used. As of October 2017, active IR/D plans for IPAs totaled \$1.36M in dollars requested with an expected actual spend of approximately \$680,000. • Delivered a “Benefits of the NSF IR/D Program” report to the DADs (March 2018), highlighting the value of IR/D in recruitment, research currency, and ethics protection. IPAs participating in IR/D are at the forefront of the research landscape and impact merit review decisions using the latest knowledge, thus having a direct impact on the NSF mission.
(c)	<ul style="list-style-type: none"> • Extended the Cost-Share Pilot into FY 2018 to continue to evaluate the effectiveness of the 10% cost-share requirement. An evaluation of the effectiveness of the IPA Cost-Share Pilot that was launched for FY 2017 indicated that there was a cost-share percentage increase from 7.2% in FY 2016 to 7.9% in FY 2017, resulting in an average cost-share increase of almost \$5,000 per IPA assignment. • Engaged with the GAO on the salary reimbursements associated with IPAs. NSF does not set the salaries for rotators who are detailed to NSF using the IPA authority, as their salaries are set by their home institutions. • Submitted to Congress responses to the American Innovation and Competitiveness Act of 2017 (P.L. 114-329) (AICA), Section 111 (Personnel Oversight), regarding the Justifications for Rotator Pay Exceeding the SES Pay Max; and Evaluation of the Cost-sharing Pilot (January 2018).
(d)	<ul style="list-style-type: none"> – Clarified NSF Policy (<i>Proposal & Award Policies & Procedures Guide</i>) requiring a substitute negotiator on proposals submitted by former NSF staff, including IPAs, for one year after their departure. – Addressed the corrective actions associated with the OIG audit NSF Controls to Mitigate IPA Conflicts of Interest (17-2-008). Three of the four recommendations in the corrective action plan have been closed by the OIG.

NSF Management’s Overview of the Challenge

NSF provides the opportunity for scientists, engineers, and educators to rotate into the Foundation as temporary Program Directors, advisors, and leaders. Rotators bring fresh perspectives from across the

²<https://www.opm.gov/policy-data-oversight/senior-executive-service/facts-figures/#url=Demographics>

Performance

country and across all fields of science and engineering supported by the Foundation, helping influence new directions for research in science, engineering, and education, including emerging interdisciplinary areas. In fact, many of these rotators remain involved in their professional research and development activities while working at NSF through participation in the IR/D program, which is managed by the NSF IR/D Council.

NSF takes a proactive approach in the management of the IPA program to appropriately consider and mitigate inherent risks associated with its execution.

Demonstrated Top Leadership Commitment:

The IPA Steering Committee reports directly to NSF Director France A. Córdoba and Chief Operating Officer (COO) F. Fleming Crim and has been in place since April 2016. The IPA Steering Committee comprises senior-level leadership across the agency, namely a Chair who is part of the agency's Senior Executive Service (SES), the Chairs of the NSF Executive Resources Board (ERB) and IR/D Council, Head of the Office of Diversity and Inclusion, and four at-large members, including two SES and two executive-level IPAs.

The IPA Steering Committee is charged with ensuring NSF is best utilizing the IPA hiring authority. It advises the Foundation's senior leadership on matters that directly concern policy on the use of the IPA program, and on common approaches to budgeting and implementation of the program. It also regularly reports on its oversight and stewardship of the IPA program, including costs associated with the program, to the Director and COO; to OMB; and to Congress, pursuant to the AICA.

Capacity:

The IPA Steering Committee is supported in the execution of its responsibilities by various NSF units with key expertise for risk management, reporting, and accountability, including BFA, the OIRM Division of Human Resource Management, the Office of General Counsel, the Office of Legislative and Public Affairs, and the Office of Integrative Activities.

Corrective Action Plan:

With this support, the IPA Steering Committee is pursuing an enterprise risk management approach to identify and understand the potential risks associated with the IPA program, the inherent impacts and likelihood of these risks, the risk reduction steps being undertaken to address these risks, and the residual risk impacts and likelihood. As part of this approach, and given the management challenges identified by OIG, four risks have been identified: frequent turnover in staff, particularly in senior leadership positions; the time that IPAs spend away from NSF, e.g., as part of their IR/D activities; internal controls associated with IPAs' conflicts of interest; and the costs associated with the IPA program.

NSF has addressed the corrective action plan associated with the most recent OIG audit on NSF Controls to Mitigate IPA Conflicts of Interest (17-2-008). Three of the four recommendations in the corrective action plan have been closed by the OIG. NSF has successfully closed all recommendations from previous OIG audits and reviews of the IPA program.

Monitoring:

Coupled with rigorous data capture, analysis, and sharing across the agency, the IPA Steering Committee is now enabling rigorous decision making to improve directional oversight for the management of the program. For example, the IPA Steering Committee analyzed the costs of the IPA program, identified potential areas for cost savings, and pursued implementation of these approaches. Additionally, it led the design and data collection effort for an evaluation of the associated policy implementation, in conjunction with NSF's Evaluation and Assessment Capability within OIA.

Demonstrated Progress:

Based on the above, NSF has taken several steps to further strengthen the IPA program. The NSF Director issued a memorandum to all NSF staff, including IPAs, in March 2017 reminding them of the importance of high ethical standards (Staff Memorandum OD 17-03); and a separate notice to supervisors, in August 2017, reminding them of their ethics responsibilities, specifically the responsibility to ensure that their subordinates, including IPAs, comply with agency ethics rules (Staff Memorandum OD 17-17). Further, the IPA Steering Committee recommended, and NSF adopted, the initiation of a pilot requiring 10% cost-sharing by every IPA’s home institution of the IPA’s academic-year salary and fringe benefits (per NSF Bulletin 16-11), which applies to all new IPA agreements initiated in FY 2017, including those for executive- and program-level staff. NSF has also ended support for lost consulting payments and, in January 2017, published a revised IR/D Guide that includes guidance limiting NSF payment of IPAs’ IR/D travel to their home institutions to 12 trips per year. This encourages IPAs to combine other NSF official business and/or telework with these trips to get the most efficient use of those travel dollars. Pending the basis for an evaluation of these changes, particularly the cost-sharing pilot, NSF extended the pilot through FY 2018.

NSF is therefore constantly improving its management of the IPA program and addressing the management challenges identified by the OIG as well as other agency-identified risks and challenges. In this way, NSF is ensuring the program fully supports the mission of the agency and the nation’s interests. Indeed, NSF believes that the steps taken to date and described above have reduced the inherent risk substantially, such that the residual risk is acceptable to the agency.

NSF’s Anticipated Milestones

(a)	(b)	(c)	(d)
<ul style="list-style-type: none"> • Deliver the first IPA Program Annual Report to the Director of NSF. This report will provide annual data and trend analyses on various aspects related to the use of IPAs at NSF, for use by the Director and NSF senior managers in assessing and overseeing the program. • Develop the CAP in response to the GAO report, “A Workforce Strategy and Evaluation of Results Could Improve Use of Rotating Scientists, Engineers, and Educators” (GAO-18-533). 	<p>Monitor time spent on IR/D by both permanent and rotating staff, and provide data to NSF senior managers to ensure appropriate oversight of IR/D.</p>	<ul style="list-style-type: none"> • Develop the year two cost-share pilot evaluation report for submission to the IPA Steering Committee and the Office of the Director. • Submit to Congress responses to the American Innovation and Competitiveness Act (P.L. 114-329) (AICA), Section 111 (Personnel Oversight), regarding the Justifications for Rotator Pay Exceeding the SES Pay Max; and Evaluation of the Cost-share Pilot. 	<p>Implement an electronic separation clearance process that tracks completion of the OGC ethics exit interviews where separating staff will acknowledge their responsibility for being familiar with post-employment restrictions.</p>

U.S. Antarctic Program (USAP) Management

Co-Leads: Assistant Director, GEO, and Office Director, Polar Programs

Summary of OIG Identified Challenge

(a)	(b)	(c)	(d)
Ensure a successful transition from Lockheed Martin to Leidos as the Antarctic Support Contractor (ASC) together with their respective subcontractors by having strong cost controls to protect the government against unwarranted increases in ASC costs during a period of reorganization and mergers.	Continue to coordinate with the ASC to soundly manage the acquisition and shipment of Antarctica-bound inventory stored and maintained at Port Hueneme, California; Punta Arenas, Chile; and Christchurch, New Zealand.	Ensure modernization of McMurdo Station as it proceeds to construction under the Antarctic Infrastructure Modernization for Science (AIMS) project by obtaining the necessary funding from Congress, capitalizing on lessons learned from NSF’s large facility work as appropriate, and minimizing the impact that the AIMS planning and construction process will have on Antarctic science.	Continue to address misconduct in the Antarctic as set forth in the 2015 OIG Report, Audit of Health and Safety in the U.S. Antarctic Program.

NSF’s Key Actions to Address the Challenge

Agency Actions Taken in Prior Fiscal Years

(a)	<ul style="list-style-type: none"> – Held routine executive meetings with Lockheed Martin leadership to understand the strategic rationale for the transition to Leidos and the impact to the ASC. – Began implementing the novation agreement processed by the Defense Contract Management Agency (DCMA) as the cognizant Federal Agency, which concluded that restructuring was in the best interest of the government. • Monitored Leidos’ operations on legacy Lockheed Martin systems. The Accounting System, Estimating System, Material Management and Accounting System, Purchasing System, and Property System were approved by DCMA in a letter dated August 25, 2016.
(b)	<ul style="list-style-type: none"> – Conducted two detailed root cause analyses in response to early fiscal year (FY) 2017 failures, followed by process improvements. NSF directed the ASC to develop reports on the damaged science equipment and mishandled science samples explaining how and why the damage occurred, and to implement corrective actions to avoid such damage in the future. NSF then approved the action plans and monitored contractor activity for effectiveness. • Modified contract policy so that going forward, senior ASC management will be directly involved in all high value-science sample shipments to ensure minimum risk. Final approval for shipment must come from the senior transportation manager. • Ensured that appropriate mitigation for the risk of loss or damage was implemented by November 2016.
(c)	<ul style="list-style-type: none"> • Continued progress on the 2012 Blue Ribbon Panel (BRP) recommendations, including investment in lifecycle acquisitions and infrastructure upgrades. • Addressed major infrastructure upgrades recommended by the BRP report for McMurdo Station through the following design efforts: <ul style="list-style-type: none"> – Completed designs for the Antarctic Infrastructure Modernization for Science (AIMS) project, including Core Facility and Utilities packages, and presented the designs to the MREFC Preliminary Design Review (PDR) Panel. – Completed designs of the Vehicle Equipment/Operations Center using NSF Research and Related Activities Funding.

	<ul style="list-style-type: none"> – Continued design on the Information Technology & Communications (IT&C) Primary Operations Center, Lodging, and Palmer Pier Replacement Projects. – Completed presentation to the National Science Board (NSB), which resulted in the NSB’s recommendation that the NSF Director or her designee include the AIMS project in a future budget request. – Completed ~ \$2M in infrastructure investments in the Black Island Telecommunications Facility to address BRP Recommendation 4.7-5, Black Island Telecommunications Facility risk management. – Issued a Sources Sought Notice on FBO.gov to apprise potential offerors on the AIMS project. <ul style="list-style-type: none"> • Continued internal coordination with LFO in order to leverage institutional knowledge pertaining to previous large facilities work, including best practices and considerations outlined in NSF’s <i>Large Facilities Manual</i> (NSF 17-066).
(d)	<ul style="list-style-type: none"> • Code of Conduct: Developed a process for reporting and reviewing Code of Conduct violations, which states that each year the Office of Polar Programs will send a request to all USAP employing organizations and NSF’s on-site representatives (for grantees) for a report of all significant instances of on ice misconduct for the previous 12 months. This audit action item (#1) regarding the USAP Code of Conduct was formally closed by the OIG on March 28, 2017. • Law Enforcement: <ul style="list-style-type: none"> – Oversaw NSF’s law enforcement program’s achievement of full compliance with all U.S. Marshals Service requirements for certification and training, and recommendations for law enforcement tools made by the Service. – Initiated planning for a future site visit to Antarctica, resources and schedules permitting. OPP had internal conversations with OGC and reached out to law enforcement organization contacts. • Breathalyzer Testing: <ul style="list-style-type: none"> – Procured breathalyzer units that do not require calibration. These units provide redundancy for the existing breathalyzer inventory. This audit action sub-item (#4.2) regarding breathalyzer calibration was formally closed by the OIG on 12/22/2015.) – Continued to explore the advisability and feasibility of the OIG-recommended requirement for breathalyzer testing for all USAP participants. Consultations with the Department of Justice on policy and legal concerns are being planned.

Actions Taken in FY 2018

(a)	<ul style="list-style-type: none"> • Monitored the transfer of business systems from Lockheed Martin to Leidos. Subsequently, the Leidos DCMA Divisional Administrative Contracting Officer reviewed and approved Leidos business systems. • Continued to monitor invoices, Annual Program Plans, business system reviews (accounting, estimating, purchasing systems), indirect rates and financial reporting for the USAP contractor to ensure strong cost controls continue with the new entity.
(b)	<ul style="list-style-type: none"> • Directed NSF’s annual assessment of ASC performance, which will identify cargo failures and contractor responses. Emphasis will be placed on opportunity costs of mishandled science samples and replacement costs of damaged inventory. Penalties will be considered in the contractor award fee. • Continued to monitor cargo shipments during the August 2017 - February 2018 cycle. • Conducted weekly NSF-led meetings with the prime contractor focused on protecting government property.

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(c)	<ul style="list-style-type: none"> • Authorized additional design to advance the AIMS design beyond bridging documents (35%). Initiated and completed necessary initial solicitation efforts for individual AIMS components. • Completed designs for and awarded IT&C Primary Addition for construction. • Initiated acquisition of major components of the Ross Island Satellite communications Earth Station (RIES) to address Black Island Telecom Facility deficiencies. • Prepared for AIMS Final Design Review (FDR), anticipated in Q1 of FY 2019. • Continued to update the long-range capital plan to include lifecycle and real property investments for all Antarctic locations.
(d)	<ul style="list-style-type: none"> • <u>Code of Conduct:</u> <ul style="list-style-type: none"> – Continued to implement NSF process for reporting and reviewing Code of Conduct violations. – Updated Code of Conduct to clarify to the community the consequences (e.g., potential removal) of misconduct in Antarctica. • <u>Law Enforcement:</u> <ul style="list-style-type: none"> – Reviewed the final report dated March 12, 2018 of a group of law enforcement officials who had conducted an on-site evaluation in February 2018. The Law Enforcement Review and Site-Visit assessed equipment and training for special deputies and reviewed other areas, such as legal jurisdiction, USAP law enforcement staffing, facilities, communications with the U.S. Marshals Service, and detainment and transportation of suspects. The report contains recommendations and suggestions. This audit action item (#3) regarding USAP Law Enforcement was formally closed by the OIG on June 12, 2018. • <u>Breathalyzer Testing:</u> <ul style="list-style-type: none"> – Finalized a memo detailing the results of NSF exploration of the advisability and feasibility of implementing a requirement for breathalyzer testing for all USAP participants. NSF determined that since USAP supporting organizations have their own breathalyzer testing programs, the benefit of establishing and enforcing an NSF-managed breathalyzer program would not be worth the legal, contractual and financial obligations. NSF decided to accept the risk of not implementing its own breathalyzer program. This audit action sub-item (#4.1) regarding the legality of requiring breathalyzer testing for all USAP participants was formally closed by the OIG on 02/05/2018.)

NSF Management’s Overview of the Challenge

NSF—through the Office of Polar Programs (OPP) in the Directorate for Geosciences (GEO)—funds and manages the U.S. Antarctic Program (USAP). The USAP supports United States’ research and national policy goals in the Antarctic. The inherent risks associated with Antarctica’s remote location, extreme environment, and the short period of time during which the continent is accessible has precipitated several actions under the USAP management challenge for NSF. These actions include: a) ensuring a successful transition from Lockheed Martin to Leidos as the Antarctic Support Contractor (ASC) while preventing unwarranted increases in cost; b) ensuring sound management of the acquisition and shipment of Antarctica-bound property and inventory stored and maintained at three ports—Port Hueneme, California, Punta Arenas, Chile, and Christchurch, New Zealand; c) ensuring modernization of McMurdo Station as it proceeds to construction under the Antarctic Infrastructure Modernization for Science (AIMS) project; and d) continuing to address misconduct in the Antarctic, including items noted in the 2015 OIG Report, *Audit of Health and Safety in the U.S. Antarctic Program*.

Through leadership commitments, dedication of staff and resources, corrective action planning, and monitoring implementation of plans, NSF has demonstrated significant progress in reducing the inherent risk to residual risk levels for USAP management that are well within acceptable ranges. The transition of

the ASC responsibilities to Leidos has occurred without disruptions in operations or unwarranted increases in cost. Management controls and operating procedures for monitoring invoice processing and systems performance are in place. Efforts are underway to evaluate an automated process to review invoices and identify inaccuracies. NSF performed root cause analyses of issues pertaining to the shipment and storage of property and inventory, and consequently developed and implemented process improvements. Routine NSF-led meetings are held with Leidos to emphasize prime contractor responsibilities to protect government property. Planning and implementation of the modernization of McMurdo Station and other large facilities work in Antarctica are underway with cognizance by the National Science Board (NSB), the Office of Management and Budget (OMB), and Congress. Plans going forward include engaging the scientific community in efforts to minimize disruption that the AIMS planning and construction process might have on Antarctic science. NSF has dedicated staff with primary responsibility of stewardship for the long-range capital plan, to include lifecycle and real property investments for all Antarctic locations. All 2015 OIG misconduct-related action items, as expressed in the *Audit of Health and Safety in the U.S. Antarctic Program*, were closed by the OIG. NSF and USAP efforts have been positive steps and continuing efforts will help ensure USAP is well poised to address misconduct in the future.

NSF’s Anticipated Milestones

(a)	(b)	(c)	(d)
<ul style="list-style-type: none"> • Continue to apply invoice processing in accordance with the current NSF “Guidance and Instructions for Invoice Review and Processing” SOP. • Evaluate an automated process to review invoices and identify inaccuracies. 	<ul style="list-style-type: none"> • Monitor cargo during the upcoming shipment cycle (August 2018 - February 2019). • Continue to conduct weekly NSF-led meetings with the prime contractor focused on protecting government property. 	<ul style="list-style-type: none"> • Complete necessary solicitation efforts for AIMS project. • Conduct AIMS Final Design Review (FDR) in Q1 of FY 2019. • Engage the scientific community in efforts to minimize disruption that the AIMS planning and construction process might have on Antarctic science. <ul style="list-style-type: none"> – Advance the long-range capital plan to include lifecycle and real property investments for all Antarctic locations. 	<ul style="list-style-type: none"> – <u>Code of Conduct:</u> <ul style="list-style-type: none"> – Continue to implement its process for reporting and reviewing Code of Conduct violations. – Continue to update the Code of Conduct as circumstances required. • <u>Law Enforcement:</u> <ul style="list-style-type: none"> – Implement appropriate changes in response to the Federal Law Enforcement Site Visit Report.

Cybersecurity and IT Management

Lead: Chief Information Officer

Summary of OIG Identified Challenge

(a)	(b)	(c)
<p><u>System Monitoring:</u> Protect information systems against unauthorized access or modification to decrease the risk of unauthorized transactions and unauthorized changes to data, audit logs, and configurations that remain undetected and affect the integrity of financial transactions.</p>	<p><u>USAP IT Security:</u> Allocate appropriate resources to correct IT weaknesses related to the U.S. Antarctic Program (USAP) and ensure the systems and information are adequately protected.</p>	<p><u>Mobile Devices:</u> Develop effective measures to preserve social media messages, capture text messages on NSF-owned devices, and monitor downloads of smartphone applications to ensure compliance with Federal requirements and guidance for electronic records management.</p>

NSF's Key Actions to Address the Challenge

Agency Actions Taken in Prior Fiscal Years

(a)	(b)	(c)
<ul style="list-style-type: none"> Continued monitoring activities to comply with the Federal Information Security Modernization Act (FISMA) and ensured ongoing operational security throughout the system lifecycle. Implemented numerous risk mitigating actions in FY 2017 to address the OIG's management challenges. Established configuration baselines for production systems and implemented the Department of Homeland Security Continuous Diagnostics and Mitigation (CDM) program Phase I with more frequent configuration scans. Documented user administration processes for the Award System and webTA. 	<p>Adjusted the USAP security plan review and updated process to provide earlier updates to validate controls being in place for the year.</p>	<p>Implemented a mobile device management (MDM) capability to enforce configuration management and ensure the integrity of agency information.</p>

Actions Taken in FY 2018

(a)	(b)	(c)
<ul style="list-style-type: none"> Established technical controls to monitor the NSF network for unauthorized access to reduce the risk of unauthorized transactions, changes to data, audit logs and configurations. Conducted configuration scans and regular reviews of audit logs and reported results to management. Proactively assessed the security state of systems through NSF's IT security continuous monitoring program. 	<ul style="list-style-type: none"> Allocated appropriate resources to the USAP IT security program to address FISMA findings. Completed security plan updates and a business impact analysis to address recovery priorities. 	<ul style="list-style-type: none"> Updated and issued guidance related to the use of smartphone applications that support encryption and/or automatically delete messages. Implemented controls in May 2018 that prohibit applications identified as violating NSF policy from being downloaded onto NSF-issued mobile devices. Prohibited applications that support encrypted communication unless their use is approved by the OGC and NSF Records Officer per federal guidance. Implemented quarterly monitoring of applications.

NSF Management's Overview of the Challenge

The availability of information technology (IT) resources and security posture of its IT systems is vital to NSF's ability to carry out its mission. The agency's Chief Information Officer is part of the Office of the Director and oversees the Foundation's proactive IT security management structure that takes a risk-based approach and provides timely and relevant information to stakeholders. The agency has assessed the risks in the three areas set forth in the OIG Management Challenge for Cybersecurity and Information Technology Management and is confident that overall the residual risks remaining are low.

As of July 2018, NSF analyzed the root causes, e.g. people, process and tools, and agency staff implemented solutions to address the three challenges noted above. NSF senior management established and committed to a Plan of Action and Milestones (POA&M) as a performance measure to monitor corrective action progress. The POA&M incorporates the IG Management Challenges for systems monitoring, USAP IT security, and mobile devices. The POA&M is updated quarterly, and a progress report is distributed to senior management for review.

Systems Monitoring. NSF established a system-wide audit log review process by implementing procedures and tools to monitor the system and report results to senior management on a regular basis. While NSF acknowledges the potential impact of unauthorized activity on agency systems, based on these actions and the above described evaluation of this risk, causes and outcomes, NSF is confident that the remaining residual risk is low.

USAP IT Security. The Office of Polar Programs (OPP), U.S. Antarctic Program (USAP) Section for Antarctic Infrastructure and Logistics (GEO/OPP/AIL) prioritized IT security initiatives and committed resources to address FISMA findings. Specifically, GEO/OPP/AIL conducted a Business Impact Analysis (BIA) to identify mission and business processes, prioritize the processes, and determine the impact on the processes if systems are unavailable. The OPP BIA identifies important functional relationships and interdependencies, as well as time sensitivities that impact the USAP mission. OPP implemented the National Institute of Standards and Technology Risk Management Framework to enable GEO/OPP/AIL to prepare, execute, and communicate in keeping with cybersecurity risk management best practices. OPP's risk-based approach to cybersecurity is supported by operational activities, regular program reviews and management reporting that support risk decisions and risk mitigation actions. Through improved oversight and resource allocation to priority tasks, OPP continues to manage the residual risk for USAP information systems.

Monitoring and reporting processes communicate cybersecurity risk to senior management to assess risk and determine appropriate courses of action consistent with organizational risk tolerance. The IT security program is evaluated in accordance with the FISMA. NSF is proactive in reviewing security controls and identifying areas to improve the IT security program and incorporates information gained and lessons learned to strengthen NSF's cybersecurity posture. NSF's adaptive risk management is very responsive to a changing cybersecurity environment with low residual risk.

Mobile Devices. In addition to ensuring the availability and strong security posture of agency IT systems, NSF recognizes the importance of protecting the integrity of information on, and appropriate use of, NSF-issued mobile devices. Part of this responsibility is ensuring that information on agency mobile devices, including smartphones and tablets, is captured and retained per Federal recordkeeping requirements. NSF's mobile device management capability enforces configuration requirements on mobile devices that access NSF email, contacts, and calendars, and provides mechanisms to ensure compromised devices are disconnected from agency systems so information is not lost. Additionally, NSF has implemented new procedures and controls which allow specific applications to be blacklisted, preventing their use on NSF-issued mobile devices. NSF has blacklisted two mobile applications that support encryption and/or the ability to automatically delete messages after they are read or sent, which could be used to circumvent

Performance

agency recordkeeping systems. NSF is monitoring installed applications on agency-issued mobile devices each quarter to identify if there are new applications that should be restricted from use. Furthermore, NSF continues to research alternatives for the automatic capture and retention of text messages on NSF-issued mobile devices and plans to have this capability in place by November 2018.

In addition to the technical controls previously described, NSF continues to educate mobile device users on their responsibilities for ensuring the capture and retention of information mobile devices per Federal records management guidance. In May 2018, the Foundation published a revised NSF Bulletin related to the assignment and use of agency mobile devices, including more detailed information on protecting and preserving agency information. The May 2018 NSF Bulletin revision updated the rules of behavior outlining responsibilities for individuals with NSF-issued mobile devices. With recent and planned actions related to NSF’s mobile device services program, comprising technology controls and policy guidance, there is low residual risk of loss for electronic records requiring capture and retention. NSF continues to evaluate its mobile device services program offerings to focus on the intersection between users and technologies, with the goal of protecting agency information against loss or disclosure.

NSF’s Anticipated Milestones

(a)	(b)	(c)
<p>Employ capabilities to further strengthen the cybersecurity program and implement application event monitoring tools and audit log reviews to detect potential unauthorized changes to financially significant data or configuration changes that affect NSF’s security process.</p>	<ul style="list-style-type: none"> • Maintain OPP operational IT security awareness, review program priorities, and allocate resources to ensure IT security program infrastructure and staffing requirements are adequate. • Ensure OPP’s NextGen project addresses IT infrastructure upgrades. 	<ul style="list-style-type: none"> • Continue to research alternatives for the automatic capture and retention of text messages on NSF-issued mobile devices and plans to implement this capability by November 2018. • Continue to evaluate additional enhancements to NSF mobile device services program, including new capabilities to preserve information and ensure the retention of agency electronic messaging and information per federal guidance.

Encouraging the Ethical Conduct of Research

Lead: Chief Operating Officer

Summary of OIG Identified Challenge

(a)	(b)	(c)
<i>It is essential that NSF continue to recognize the importance of its Responsible Conduct of Research (RCR) requirement. It is important to emphasize research integrity as a core value.</i>	<i>NSF awardees could benefit from NSF providing written guidelines or templates for universities to follow. NSF has an opportunity to encourage incorporation of best practices into RCR programs.</i>	<i>NSF should encourage institutions to extend their RCR programs to faculty.</i>

NSF’s Key Actions to Address the Challenge

Agency Actions Taken in Prior Fiscal Years

Issued Important Notice No. 140, Training in Responsible Conduct of Research – A Reminder of the NSF Requirement from the NSF Director on August 17, 2017.

Actions Taken in FY 2018

(a)	<ul style="list-style-type: none"> • Evaluated themes and common threads of research misconduct cases and used the analysis to draft additional guidance for the FY 2019 Proposal and Award Policies and Procedures Guide (PAPPG) on the definition and consequences of research misconduct and on NSF-funded resources available for RCR training. • Revised Cultivating Cultures for Ethical STEM (CCE STEM) program solicitation to incorporate specific references to RCR training and online resources to assist with RCR training. • Sponsored an SBE special lecture at NSF, “Fighting against Doubt and Promoting Public Trust in Research Practices”, presented by Kristen Intemann. • Emphasized integrity as a core value in the NSF strategic plan, <i>Building the Future: Investing in Discovery and Innovation</i>, by specifically stating that “We hold each other and our awardees to the highest standards of ethical behavior. We strive to ensure the trustworthiness of the results of NSF-funded research by promoting the responsible conduct of research.” • Included RCR requirement in NSF outreach at the NSF Grants Conference and other outreach events.
(b)	<ul style="list-style-type: none"> • Incorporated a reference to Chapters 9 (“Identifying and Promoting Best Practices for Research Integrity”) and 10 (“Education for the Responsible Conduct of Research”) of <i>Fostering Integrity in Research</i> (National Academies of Sciences, Engineering, and Medicine, 2017) (NASEM Report) into the draft PAPPG scheduled for publication in October 2018. • Encouraged awardees to incorporate promising RCR practices by initiating outreach regarding proposed PAPPG changes. • Revised the CCE STEM program solicitation to incorporate the <i>Fostering Integrity in Research</i> conclusion that “training for responsible conduct of research is most effective when it is part of a comprehensive approach to enhance an organization’s research enterprise.” • Synthesized a set of findings regarding best ethical research practices based on reports from three of the ethics workshops NSF funded over the past three years. • Held meeting with CCE STEM PIs to review synthesized workshop findings and receive input on dissemination plans.
(c)	<ul style="list-style-type: none"> • Produced a set of slides on RCR and research misconduct for use in NSF staff outreach to the research community, suggesting that STEM faculty incorporate RCR into their mentoring, teaching, and curriculum development. • Held NSF senior management briefings about the importance of involving PIs and Co-PIs in the RCR requirement.

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<ul style="list-style-type: none"> • Drafted guidance language for the FY 2020 PAPPG: “NSF encourages training of faculty in the responsible and ethical conduct of research.”

NSF Management’s Overview of the Challenge

NSF leadership emphasizes that NSF does not tolerate research misconduct, which means fabrication, falsification, or plagiarism in proposing or performing research funded by NSF, in reviewing research proposals submitted to NSF, or in reporting research results funded by NSF. The OIG investigates allegations of research misconduct and makes recommendations to NSF for disposition. NSF’s Chief Operating Officer decides on disposition of the referrals for research misconduct based on input from staff in the Office of General Counsel, the Office of Integrative Activities, and the Office of the Director. In 2017, the NSF Director issued an Important Notice reminding NSF awardees of the NSF requirement for training in responsible conduct of research, and NSF’s strategic plan for FY2018-2022 emphasizes integrity as a core value. As reported by the OIG in its Spring 2017 Semiannual Report, the number of research misconduct referrals to NSF from FY 2005 through FY 2017 has remained relatively low and has not trended upward. NSF also performed a more detailed root cause analysis of referrals to the agency by the OIG in FY 2016 and FY 2017. In this 2-year period, NSF made 23 findings of research misconduct based on 24 referrals (excluding referrals arising from the Small Business Innovation Research/Small Business Technology Transfer programs). Nine of the findings arose from plagiarism by faculty in proposals to NSF that were not funded. Considering that the total number of referrals by the OIG is relatively low and NSF reviewed over 98,000 proposals and funded over 23,000 proposals in the same period, it is difficult to identify trends. However, NSF notes that a significant subset of findings involve plagiarism by faculty in unfunded proposals. NSF is addressing these issues through additional guidance and outreach. NSF will continue to track and analyze the OIG’s investigation referrals to assess responsive actions and identify new trends. NSF recognizes the potential high impact of research misconduct and has taken actions to reduce the likelihood of such activities.

NSF’s Anticipated Milestones

(a)	(b)	(c)
<p>Publish the 2019 PAPPG with the additional language on the definition and consequences of research misconduct and on the NSF-funded resources available for RCR training.</p>	<ul style="list-style-type: none"> • Continue to fund the Online Ethics Center and research on best practices. • Incorporate workshop findings into the Online Ethics Center. • Hold a “promising practices summit” conference with examples of effective RCR approaches. • Publish revised PAPPG incorporating a reference to Chapters 9 (“Identifying and Promoting Best Practices for Research Integrity”) and 10 (“Education for the Responsible Conduct of Research”) of the NASEM report. • Continue to encourage awardees to incorporate promising RCR practices by initiating outreach regarding new PAPPG changes. 	<ul style="list-style-type: none"> • Use the new outreach materials for encouraging faculty to participate in RCR training and demonstrate best practices. • Encourage STEM faculty to incorporate RCR in their mentoring, teaching, and curriculum development.