

FY 2017 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 2017 on the management challenges identified by NSF's Inspector General at the beginning of that fiscal year.

FY 2017 Management Challenges

- Establishing Accountability over Large Cooperative Agreements
- Management of NSF's Business Operations: Improper Payments
- Management of NSF's Business Operations: Information & IT Resources
- Management of NSF's Business Operations: Transparency & Accountability (DATA Act)
- Management of NSF's Business Operations: Government Records
- Management of the Intergovernmental Personnel Act (IPA) Program
- Moving NSF Headquarters to a New Building
- Management of the U.S. Antarctic Program
- Improving Grant Administration
- Encouraging the Ethical Conduct of Research

FY 2018 Management Challenges

- Major Multi-User Research Facilities Management
- Business Operations Management: Improper Payments
- Business Operations Management: Transparency & Accountability
- Business Operations Management: Monitoring Subrecipients
- Business Operations Management: Government Records
- Management of the *Intergovernmental Personnel Act* (IPA) Program
- Management of the U.S. Antarctic Program
- Cybersecurity and Information Technology Management
- Encouraging the Ethical Conduct of Research

¹ www.nsf.gov/about/performance

Establishing Accountability over Large Cooperative Agreements

Lead: Branch Chief, BFA/DACS/CSB

NSF Management Overview

The Office of Inspector General (OIG) challenge relates to NSF's oversight of major facilities construction and operations cooperative agreements. The Foundation currently utilizes end-to-end oversight policies and procedures to ensure adequate stewardship over federal funds for the full project life-cycle. These activities are carried out starting with the day-to-day oversight by the Science and Engineering Directorates and the Office of Budget, Finance and Award Management (BFA) and extend through the decisional and governing responsibilities of the Office of the Director (O/D) and the National Science Board (NSB). The Major Research Equipment and Facility Construction (MREFC) Panel provides additional oversight of the design stage, which includes readiness for advancement and establishing the performance baseline for construction. Within BFA, the Large Facilities Office (LFO) develops policies and procedures related to large facilities, provides assistance to the program offices, and assures that policies, procedures, and good practices are being followed. Other BFA assurance units include the Cooperative Support Branch within the Division of Acquisition and Cooperative Support (DACS/CSB) and the Division of Institution and Award Support's Cost Analysis and Pre-award Branch (DIAS/CAP), which supports cost analysis and other pre-award activities in an advisory capacity to CSB.

NSF has been continuously enhancing its pre-award and post-award oversight of major facilities in construction and operations since June 2014. These enhancements are documented in the latest revision of the Large Facilities Manual (LFM) and internal Standard Operating Guidance (SOG). The December 2015 report by the National Academy of Public Administration (NAPA) supported NSF's use of cooperative agreements. However, the report also noted that NSF should "apply equal emphasis to increased internal management of the business practices critical to the enhanced oversight and project success" in order to bring them into balance with the science and technical aspects of oversight.

Challenge 1

Ensure adequate oversight of large facilities awards, including operations awards. Ensure that the emphasis on science results does not come at the expense of sound business practices, noting NAPA's call for equal emphasis on these two objectives.

Progress Made in FY 2017

- Revised the Large Facilities Manual (NSF 17-066) to codify American Innovation and Competitiveness Act (AICA) requirements and other newly-strengthened oversight requirements for NSF and Recipients.
- In accordance with AICA and BOAC Subcommittee recommendations, named the NSF Chief Operating Officer (COO) as the agency "Senior Accountable Official" for major facilities oversight.
- Implemented process for conducting incurred cost audits and accounting system audits led by CSB.
- Socialized new oversight requirements with major facilities community at annual Large Facilities Workshop (May 2017).
- Revised the A-123 Major Facilities Oversight Process Narrative.
- Implemented a new combined annual CSB/LFO major facilities portfolio risk assessment in draft form (June 2017) to increase engagement and collaboration between CSB, LFO, and Programs in assessing risk and selecting cooperative agreement Recipients for review activities including audits.

Future Implementation Milestones

- Finalize internal Standard Operating Guidance for joint CSB/LFO annual portfolio risk assessment (Fall 2017).

- Consider OD staffing requirements to support COO as Senior Accountable Official and periodic Directorate-level major facilities briefings with COO. (Fall 2017)

Challenge 2

Ensure access to quality Earned Value Management (EVM) data; validate the EVM report that awardees provide and require that EVM systems be certified.

Progress Made in FY 2017

- Codified and implemented Earned Value Management System (EVMS) Verification, Acceptance and Surveillance procedures (LFO SOG 17-2).
- Completed EVMS Acceptance on DKIST and LSST projects.
- Completed Verification Review of the Regional Class Research Vessel (RCRV) project EVMS.

Future Implementation Milestones

- Complete acceptance of RCRV project EVMS prior to initiating physical ship construction (Spring 2018).
- Conduct EVMS Verification Review on the Antarctic Infrastructure Modernization for Science (AIMS) project (December 2017).

Challenge 3

Implement new policy changes based on NAPA and OIG recommendations to ensure effective oversight.

Progress Made in FY 2017

- Closed nearly 50 of the 55 OIG recommendations (90 percent) related to oversight of major facilities dating back to 2012.
- Received BOAC NAPA Implementation Subcommittee Report and began consideration/implementation of recommendations (March 2017).
- Initiated BOAC Subcommittee on Cost Surveillance to assess NSF's strengthened policies and procedures (June 2017).
- Developed and implemented revised internal policies and procedures related to "fee" (July 2017).

Future Implementation Milestones

- Develop and implement new internal policies and procedures related to management reserve (Fall 2017).
- Implement formal Lessons Learned program (preparing pilot for launch at Large Facilities Workshop; May 2018).
- Enhance documentation and formalization of NSF Communities of Practice (PO Forum Charter; Fall 2017).
- Implement NSF-wide "Core Competency" staff requirements (Standard Operating Guidance) related to major facilities oversight (Fall 2017).
- Strengthen MREFC Panel oversight role (full life-cycle) based on BOAC subcommittee recommendations (Pilot new "Major Facilities Panel" concept in Q1 CY 2018).
- Revise and implement internal policies and procedures related to NSF cost analysis, and independent cost estimate reviews based on American Innovation and Competitiveness Act (AICA) requirements (Fall 2017).

Management of NSF's Business Operations: Improper Payments

Lead: Division Director, BFA/DFM

NSF Management Overview

NSF Management does not consider improper payments to be a significant risk to NSF's mission, programs, or operations. In May 2017 the NSF OIG issued a report on NSF's compliance with the Improper Payment Elimination and Recovery Act (IPERA) requirements for FY 2016. The OIG concluded the NSF complied with the requirements of IPERA and had addressed all recommendations from the previous OIG report. This was the second consecutive report finding NSF in compliance with IPERA reporting requirements. The May 2017 OIG report had no recommendations and no resolution tracking requirements. The two reports validate that NSF has taken the steps necessary to demonstrate compliance and effectiveness in the agency's implementation of IPERA. In summary, 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;
- Executed an action plan that addressed the root cause 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.

The milestones listed below describe NSF's efforts to maintain and monitor IPERA compliance.

Challenge

i) Address significant limitations in NSF's analysis of six of the nine White House Office of Management and Budget (OMB) risk factors, and ii) improve assessment of NSF payments to employees, e.g. payroll testing and interviewing HRM regarding administering salary and benefits. OIG has made eight recommendations to strengthen NSF IPERA risk assessments.

Progress Made in FY 2017

- Developed and published standard operating guidance (SOG) BFA 2017-1 on November 10, 2016 for improper payments risk reviews incorporating the nine IPERA risk factors and additional considerations from the OIG review report.
- Completed an improper payments risk review for FY 2016. The risk review included input from subject matter experts for grants, contracts, charge cards, and payments to employees.
- Received OIG inspection of the FY 2016 risk review, which found NSF in compliance with the requirements of IPERA.

Future Implementation Milestones

- Update the improper payments risk review SOG by providing additional details for the process to obtain and group fiscal year disbursements and refine the evaluation of the SME input on the nine IPERA risk factors. Publish the update by November 1, 2017.
- Complete an improper payments risk review for FY 2017 outlays per the SOG (planned for early FY 2018).
- Plan and conduct an improper payments risk assessment for FY 2018 by December 31, 2018.

Management of NSF's Business Operations: Information & IT Resources

Lead: Division Director, OIRM/DIS

NSF Management Overview

NSF is aware that the availability of IT resources and security posture of its information technology (IT) systems is of critical importance to the Foundation's ability to carry out its mission, particularly in a year in which NSF is relocating its headquarters. NSF employs tools and technology in its Information Security Continuous Monitoring (ISCM) program to continuously monitor the network availability and security posture. As part of the ISCM program NSF implemented the Department of Homeland Security (DHS) Continuous Diagnostic and Mitigation (CDM) tools and technology to monitor the network. The IT security program is evaluated yearly by an independent organization in accordance with the Federal Information Security Management Act (FISMA). NSF has been proactive in reviewing security controls and identifying areas to strengthen the program, including incorporation of information gained and lessons learned from the FISMA report.

The Office of Polar Programs (OPP) U.S. Antarctic Program (USAP) proactively monitors its network to ensure compliance with security requirements. OPP allocates appropriate resources to the USAP IT security program to address information security requirements and FISMA review findings.

Challenge

(i) Before the move in FY 2017, NSF should increase the timing and robustness of IT testing, and after the move, NSF should ensure agency information and IT resources remain available, secure, and complete. Efforts may be assisted by using information security continuous monitoring (ISCM) strategies.

(ii) Allocate appropriate resources to correct IT weaknesses related to the U.S. Antarctic Program (USAP) and ensure the systems and information are adequately protected.

Progress Made in FY 2017: NSF Move

- Continued to maintain a detailed move plan for IT systems and services with comprehensive IT applications testing and validation, including user testing, as IT services are transitioned to the new headquarters building.
- Completed the electronic move of applications, databases and servers, and validation testing successfully in June 2017.
- Completed the physical server move and validation testing successfully in July 2017.
- Utilized information security continuous monitoring (ISCM) resources, tools, and strategies to ensure continued availability of services and applications during the stabilization period following NSF's staff moves in late summer/early fall 2017.

Progress Made in FY 2017: U.S. Antarctic Program (USAP)

The Office of Polar Programs (OPP):

- Completed a thorough review of USAP IT security program controls to ensure compliance with federal guidance and risk management and adequacy of risk management plans.
- Allocated appropriate resources to the USAP IT security program to address information security findings identified in the annual FISMA review.
- Documented redundancy capabilities to IG auditors to demonstrate resiliency of the USAP network and re-evaluate a longstanding finding to close the original issue.
- Initiated a disaster recovery plan to document actions in the event of a contingency. OPP is also planning to complete a business impact analysis to validate their approach to service recovery.

Performance

Future Implementation Milestones

- Continue to monitor the availability, responsiveness, and security of agency IT resources during and after the move to the new headquarters, utilizing information security continuous monitoring (ISCM) strategies in support of these activities.
- Continue to address identified IT security weaknesses through USAP program funding.

Management of NSF's Business Operations: Transparency & Accountability (DATA Act)

Lead: Chief Financial Officer, Senior Accountable Official

NSF Management Overview

NSF successfully implemented the Digital Accountability and Transparency Act (DATA Act) on April 28, 2017. The 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. NSF senior agency officials were aware of the Act early on, and when the legislation passed, NSF moved immediately to leverage its resources to prepare for implementation. At NSF, the DATA Act has been a cross-agency initiative with early leadership from the NSF Office of the Director supported by subject matter experts in BFA and the Office of Information and Resource Management (OIRM) for implementation support, and an internal governance structure that included an executive-level steering committee, a DATA Act Working Group (DAWG) and a DATA Act Project Management Office (PMO). The Senior Accountable Official (SAO) is presently the Acting Chief Financial Officer (CFO) and Office Head of BFA.

Additionally, NSF collaborated with its OIG around stewardship and supported the OIG in its efforts to publish a DATA Act readiness review by November 2016. OIG staff have consistently had access to all DATA Act-related materials through meetings, interviews and the DAWG SharePoint site. NSF implemented all of the OIG project management-related recommendations and took steps to address ongoing OIG concerns around human resources planning.

Government-wide, NSF staff have represented the agency in connection with DATA Act-related activities, including the Financial Assistance Committee for E-government (FACE); the Data Standards Committee, an Executive-level interagency group representing the budget, financial assistance and procurement communities charged with making recommendations on issues of government-wide data standardization; the Procurement Committee for E-government; and numerous additional DATA Act-related workshops, meetings and small-group strategy sessions with OMB, Treasury, and other CFO Act agencies. These collaborations have been key to NSF's DATA Act implementation success.

NSF success is also attributable to its risk-based approach to implementation. The agency actively took steps to identify and mitigate risks and evaluated multiple approaches to ensure on time compliance. No major system changes were required in order for NSF to meet the deadline. Going forward, the agency will work towards operationalizing the DATA Act submission and will continue its successful and on time implementation. The DAWG will continue to foster strong internal, executive-level and government-wide communication, as needed, and will continue to support the OIG as needed in its upcoming DATA Act audit scheduled for publication by November 2017.

Challenge

Achieve successful implementation of the DATA Act despite evolving federal guidance, the late release of Treasury's production-ready broker, the late release of iTRAK software patches, limited available agency FTE, the potential that NSF's relocation may impact DATA Act activities, and the lack of a clear funding source for NSF's DATA Act implementation efforts.

Progress Made in FY 2017

- Developed and implemented a Corrective Action Plan in response to OIG Readiness Review.
- Developed human resources tracking document maintained on SharePoint in response to ongoing OIG DATA Act staffing concerns.
- Generated and tested Award Submission Portal (ASP) data file per Treasury's evolving specifications from FY 2016 Q3 through FY 2017 Q1.

Performance

- Developed a business intelligence solution for generating ASP submission and correction files using the award data from the Awards system and System for Award Management (SAM) information from iTRAK data extracts, for submitting NSF's financial assistance data to USASpending.gov.
- Complied with ASP submission requirements to USASpending.gov starting with January 2017 data submission.
- Implemented initial Oracle patch for award attributes and modified award system interfaces with iTRAK to populate the following attributes: Procurement Instrument Identifier (PIID), Parent Award Identifier (PAID), Federal Award Identification Number (FAIN), and Unique Record Identifier (URI).
- Uploaded financial assistance and procurement files to populate the award attributes in iTRAK.
- Implemented Oracle patch for main DATA Act functionality to configure mappings and generate files that are required to be submitted to Treasury's production-ready broker (Broker) for subsequent public reporting of financial data. [These files are: file A (Appropriations Account Data), B (Object Class and Program Activity Data), and C (Award Financial Data).]
- Developed custom solution (alternative, back-up approach) that leverages existing iTRAK reports and NSF tools to generate files A, B, and C, and reconciliation reports to mitigate risk of not having the Oracle patches ready for DATA Act compliance by May 2017.
- Developed Program Activity mappings to crosswalk iTRAK file B data with Program Activity Codes from the Program and Financing (P&F) Schedule in the President's Budget Appendix.
- Generated files A, B, and C using the custom solution.
- Performed Broker testing by uploading agency-generated files A, B, and C.
- Performed Broker testing by extracting data for files D1 (Award and Awardee Attributes for Procurement), D2 (Award and Awardee Attributes for Financial Assistance), E (Additional Awardee Attributes), and F (Sub-award Attributes).
- Performed Broker testing in order to validate files A through F to facilitate certification of NSF's data.
- Implemented custom solution to generate files A, B, C, and reconciliation reports, and submitted files A - F prior to the DATA Act compliance date of May 2017.
- Achieved compliance with May 2017 DATA Act implementation deadline.
- Received the Secretary's Certificate of Appreciation from the U.S. Department of the Treasury in recognition of NSF's outstanding commitment to collaboration while implementing the DATA Act on June 28, 2017.
- Documented standard operating procedures for generation, certification, and submission of files A- F.
- Engaged with OIG and responded to the OIG Provided by Client (PBC) List with requested materials in support of the OIG DATA Act audit report to be published in November 2017.
- Provided agency source data to Government Accountability Office (GAO) and answered questions to support GAO's mandated government-wide DATA Act Data Quality Review; NSF data that had been posted on beta.USASpending.gov was included in the sample of government-wide data GAO pulled to conduct its review.

Future Implementation Milestones

- Transition financial assistance (file D2) reporting from the existing ASP to comply with Treasury's DATA Act Information Model Schema (DAIMS) v1.1 and Financial Assistance Broker Submissions (FABS) scheduled in September 2017 and DAIMS v2.0 in Spring 2018.
- Continue to use the custom solution to generate files A, B, C, and reconciliation reports, and submit files A - F on a quarterly basis until a decision is made on how to move forward with the Oracle patches.
- Continue to refine and document all DATA Act-related business processes and Standard Operating Procedures (SOPs).
- Continue to provide information to GAO and OIG in connection with DATA Act reviews.

Management of NSF's Business Operations: Government Records

Lead: Division Director, OIRM/DAS

NSF Management Overview

In 2012, OMB and the National Archives and Records Administration (NARA) issued a directive, OMB Memorandum M-12-18, Managing Government Records. This directive is consistent with a 2011 Presidential Memorandum requiring Federal agencies to reform the policies and practices for the management of physical records and to provide a framework for the management of electronic records.

GAO subsequently issued Report 15-339, dated May 14, 2015, "Information Management: Additional Actions Are Needed to Meet Requirements of the Managing Government Records Directive". NSF formulated a Corrective Action Plan (CAP) in response to the GAO report and is on schedule to meet all the planned actions enumerated in the CAP. Additionally, NSF hired a dedicated professional in its Records Management Section to oversee implementation of the CAP and efforts associated with the relocation of NSF's headquarters.

Challenge

Ensure compliance with the National Archives and Records Administration's 2012 directive to take specific reform actions by designated dates. In particular, meet deadlines associated with relocating NSF's headquarters by: (i) ensuring appropriate training and guidance for employees; (ii) updating NSF's record retention schedules to classify electronic records as official agency records; and (iii) adhering to established agency schedule to review, scan, and digitize its paper records.

Progress Made in FY 2017

- Revised the records management training course to comply with NARA Bulletin 2017-01, Agency Records Management Training Requirements in June 2017. The revised course will be required training for all staff on an annual basis.
- Classified the Office of Inspector General's (OIG) electronic records as official records per the OIG Records Schedule (DAA-0307-2016-0003) as approved by the Archivist of the United States on January 6, 2017.
- Scanned over 7,000 permanent and temporary records from August 2016 to August 2017 to reduce the footprint of hardcopy files ahead of NSF's move to its new headquarters.

Future Implementation Milestones

- Update the records management policy that is dated October 1988 to comply with current NARA guidance and 36 CFR Chapter XII, Subchapter B - Records Management, and issue by March 31, 2018.
- Complete an agency-wide records inventory by the end of FY 2018 to provide a foundation for developing file plans and additional records schedules as needed.
- Create an online training for the Electronic Records Management System (ERMS) and make it available in LearnNSF by December 31, 2017.
- Destroy all records at the Federal Records Center (FRC) that have met their disposition date and are no longer required by the agency by the end of FY 2018, and continue to scan records to put in ERMS. Both activities will reduce annual storage costs at FRC.
- Update remaining record schedules and classify electronic records as official agency records, and get approvals from the Archivist of the United States by the end of FY 2019.

Management of the IPA Program

Lead: Division Director, OIRM/HRM

NSF Management Overview

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 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 fields. In fact, many of these rotators remain involved in their professional research while working at NSF through participation in the Independent Research/ Development (IR/D) program (managed by the NSF IR/D Council). Because NSF supports fundamental research at the frontiers of science and engineering, NSF relies on the synergy of federal employees and temporary staff for a constant infusion of new knowledge into the broad understanding of science, and a continuously improving structure of systematic and rigorous merit review. Federal and rotating staff and executives partner to ensure NSF stays abreast of and supports the very latest research ideas while ensuring stability and continuity of operations and strong stewardship and accountability of taxpayer resources. For example, federal Deputy Assistant Directors (DAD) provide continuity for rotating Assistant Directors (AD).

In April 2016, NSF Director France A. Córdova announced the establishment of a Steering Committee for Policy and Oversight of the IPA Program (IPA Steering Committee). The Steering Committee serves as the primary body for considering IPA-related policies, oversees common approaches to budgeting and implementation of the IPA program, and champions the effective use of IPAs, identifying the benefits they bring the agency and the actions taken by the agency to mitigate risks and costs. The IPA Steering Committee is Chaired by the Chief Human Capital Officer (CHCO) with membership consisting of the Chair of the NSF Executive Resources Board (ERB) and the Independent Research and Development (IR/D) Council; the Head of the Office of Diversity and Inclusion, and four at-large members, including two IPAs.

In June 2017, NSF's OIG issued the audit report, "NSF Controls to Mitigate IPA Conflicts of Interest." The report concluded that NSF had "implemented internal controls to identify and mitigate IPA conflicts of interest." NSF formulated a corrective action plan in response to the OIG's recommendations to strengthen and add additional controls.

Challenge

The challenges that come with NSF's Intergovernmental Personnel Act (IPA) program are as follows: i) Almost constant turnover in staff at NSF, especially in senior leadership positions; ii) Due to IR/D activities, the amount of time IPAs spend at their home institutions raises questions about their ability to fulfill their responsibilities at NSF and be fully engaged in the agency's mission; iii) It is critical that strong controls be in place to identify and mitigate IPA conflicts of interest; and iv) NSF's reliance on IPA's comes with a high cost. The number of IPAs and their cost (i.e., salaries, benefits, travel) have increased in the last 3 years. IPAs are not subject to federal pay and benefits limits.

Progress Made in FY 2017

- Issued a memorandum to NSF staff, including IPAs, in March 2017 reminding them of the importance of high ethical standards (Staff Memorandum OD 17-03); also issued a notice to supervisors, in August 2017, reminding them of their ethics responsibilities, specifically the responsibility to ensure the compliance of their subordinates, including IPAs, with the ethics rules (Staff Memorandum OD 17-17).
- Initiated a pilot requiring 10% cost sharing by the 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. Additionally, NSF will no longer provide for Lost Consulting payments.

- Published a revised IR/D Guide in January 2017, via the IR/D Council, 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.
- Designed and began data collection for an evaluation, initiated in the Office of Integrated Activities (OIA), to determine the cost implications associated with the 10% cost-sharing pilot and determine to what extent the policy change impacts NSF's ability to recruit strong IPAs.
- Closed the sole open OIG audit recommendation related to IPA costs.
- Reviewed and updated core policies relating to IPAs in the NSF Personnel Manual.
- Strengthened communication and implemented regular meetings between the Chief Operating Officer and Deputy Assistant Directors to reinforce and support leadership continuity.
- Implemented a process for Chief Operating Officer review and AD/DAD discussion of IPA salary cases that exceed the Senior Executive Service cap.

Future Implementation Milestones

- Develop an Integrated Workforce Strategy as part of NSF's Agency Reform activity. This workforce framework will aid in identifying the balance of Federal and Rotator Executive Resources within the Research Directorates. An initial draft will be submitted to the IPA Steering Committee in October 2017.
- Deliver the cost sharing pilot evaluation to the IPA Steering Committee in November 2017.
- Clarify and improve enforcement of policies on the submission of preliminary and new proposals while serving as an IPA and designation of a substitute negotiator for proposals submitted until one year after departure.
- Implement an electronic separation clearance process that tracks completion of exit interviews where separating staff will acknowledge their responsibility for being familiar with post-employment restrictions.

Performance

Moving NSF Headquarters to a New Building

Lead: Senior Relocation Project Officer, OIRM/OAD

NSF Management Overview

NSF began to occupy its new location in Alexandria, Virginia in August 2017 and is well-positioned to vacate its Arlington, Virginia locations by December 31, 2017. The NSF Relocation Office (NRO) is leading this effort and is charged with ensuring a successful outcome to NSF's expiring lease effort through the delivery of a next-generation NSF headquarters facility. NRO's mission is accomplished through input of the entire NSF staff through Directorate liaisons, the American Federation of Government Employees (AFGE) Union-Local 3403, the agency Relocation Executive Advisory Group (REAG), the General Services Administration (GSA), and other stakeholders to the project.

Through demonstrated leadership and disciplined project management, NRO continues to make significant progress in key areas to ensure project success and mitigate risks relating to scheduling delays, union negotiations, and records management. NRO has developed a detailed relocation plan and has also taken concrete steps to align the project's budget with its estimated cost.

Groundbreaking for the new NSF Headquarters was in January 2014, construction on the interior space began in April 2016, and the building was substantially complete to begin occupancy by NSF staff in August 2017. The new building will prominently reflect NSF's role nationally and internationally in the science and engineering community.

Challenge

Ensure NSF has a complete, accurate, and updated schedule to meet the move deadlines before leases on the existing buildings expire at the end of 2017.

Progress Made in FY 2017

- Added NSF Relocation to the Director's Watch List in March 2017 and met with the Director six (6) times.
- Relocated the NSF data center and network from Arlington to Alexandria successfully prior to the relocation of staff.
- Installed the majority of NSF personal property designed for the new building (e.g. furniture, audio-visual equipment, information technology, and security equipment) prior to the relocation of staff.
- Prepared agency staff for the relocation:
 - Conducted numerous town halls and education sessions to advise staff on features and services in the new building as well as detailed packing guidelines and procedures for the physical move.
 - Created a dedicated relocation website on the NSF intranet that included answers to frequently asked questions, completed floor plans, transportation options to the new headquarters, neighborhood information, etc.
 - Shared multiple informational articles and videos on the relocation website and in NSF's weekly newsletter to keep staff apprised of all relocation-related news and updates.
- Reached agreement with our union partners on key issues (e.g., parking, physical relocation) during the third and final phase of negotiations.
- Substantially completed construction of the interior space. City of Alexandria has conducted its final inspections of the building.

Future Implementation Milestones

- Complete the relocation to Alexandria successfully.
- Vacate and return Stafford I & II and the Rosslyn location to the landlords before December 31, 2017.

Management of the U.S. Antarctic Program

Lead: Division Director, GEO/PLR

NSF Management Overview

Through the Office 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, 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.

Challenge 1

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.

Progress Made in FY 2017

- Held routine executive meetings with Lockheed Martin leadership to understand the strategic rationale for the transition to Leidos and the impact to the Antarctic Support Contract (ASC).
- Started 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.
- The successful transition from Lockheed Martin to Leidos through a Reverse Morris Trust has resulted in decreased costs for ASC.

Future Implementation Milestones

- Continue to monitor the ongoing transfer of business systems from Lockheed Martin to Leidos, which is expected to be complete by January 1, 2018. Subsequently, the Leidos DCMA Divisional Administrative Contracting Officer will review and approve Leidos business systems.
- Continue 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.

Challenge 2

Ensure modernization of McMurdo Station and upgrades to Palmer Station as they proceed to construction projects, capitalizing on lessons learned from NSF's large facility work as appropriate.

Progress Made in FY 2017

- 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:
 - 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.

Performance

- Completed designs of the Vehicle Equipment/Operations Center using NSF Research and Related Activities Funding.
- 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.
- Issued a Sources Sought Notice on FBO.gov to apprise potential offerors on the AIMS project (https://www.fbo.gov/index?s=opportunity&mode=form&id=b1177342be2eaf94c01809ece0e1854&tab=core&_cview=0).
- 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 Large Facilities Manual (NSF 17-066).

Future Implementation Milestones

- Initiate and complete necessary solicitation efforts for individual AIMS components.
- Complete designs for IT&C Primary Operations Center.
- Conduct advance planning/design for Ross Island Earth Station (RIES).
- Prepare for AIMS Final Design Review (FDR), anticipated in Q1 of FY 2019.
- Continue to update the long range capital plan to include lifecycle and real property investments for all Antarctic locations.

Challenge 3

Continue to provide oversight of costs incurred for medical expenses under the ASC and its subcontractors by providing guidance on what expenses are eligible for reimbursement.

Progress Made in FY 2017

- Improved USAP participant guidance for Physical Qualification (PQ) exams by better stating required tests and warning of non-reimbursable costs.
- Reviewed PQ requirements, along with the contractor, during the May 2017 medical retreat in preparation for the June 2017 medical review panel meeting.

Future Implementation Milestones

- Continue to review and modify PQ requirements, including during the annual medical review panel meetings
- Receive contractor assessments of PQ non-reimbursable charges and reports of participant confusion with PQ process in order to guide continuous improvement.

Challenge 4

Continue to provide investment in the oversight of both small and larger invoiced costs from ASC until NSF is better assured of the USAP contractor's internal controls.

Progress Made in FY 2017

- Continued to apply invoice processing in accordance with the "Guidance and Instructions for Invoice Review and Processing" SOP.
- Requested periodic, full listings of materials/items of less than \$5,000 for review.

Future Implementation Milestones

- Continue to apply invoice processing in accordance with the "Guidance and Instructions for Invoice Review and Processing" SOP.

- Perform a “deep dive” review of a random 10% of invoices.
- NSF will continue to evaluate Leidos subcontractor billing processes. Leidos mechanisms to monitor and validate the accuracy of subcontractor billing and subsequent billing to NSF include random sampling, subcontractor rate analysis and bi-weekly and monthly billing reconciliation.

Challenge 5

Continue to coordinate with the ASC to identify and control risks (e.g., loss or damage) of Antarctica-bound inventory stored and maintained at Port Hueneme, California; Punta Arenas, Chile; and Christchurch, New Zealand.

Progress Made in FY 2017

- Conducted two detailed route-cause analyses in response to early 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 would be implemented by November 2016.

Future Implementation Milestones

- Direct 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.
- Continue to monitor the next surge of cargo shipments, which began in August 2017 and will continue through February 2018. Weekly NSF-led transportation meetings will continue to emphasize ASC responsibility to protect government property and science samples.

Improving Grant Administration

Lead: Division Director, BFA/DIAS

NSF Management Overview

As of June 30, 2017, the NSF award portfolio consisted of 41,877 active awards, representing \$26.6 billion in obligated funds to 2,983 unique awardees. NSF accountability efforts span six award stages (proposal submission, merit review, pre-award financial review, post-award monitoring, award closeout, and audit follow-up) to ensure financial capability and accomplishment, non-financial administrative and programmatic compliance, and research performance. The foundation of NSF's accountability efforts is its suite of policy and procedural documents that incorporate federal regulations, legislative mandates, and agency-specific requirements; the translation of policies and procedures into business rules that are enforced through NSF's information technology systems; and a risk-based approach to financial and administrative monitoring. Baseline monitoring activities, which are conducted on most awards through standard, recurring, and automated processes, focus on post-award administration and financial transactions to identify exceptions and potential issues that may require scrutiny through advanced monitoring. Financial baseline monitoring is used to identify potential anomalies, inaccurate expenditure reporting, or evidence of a possible misunderstanding of, or non-compliance with, federal cash management requirements and/or NSF guidelines.

In FY 2017, major accomplishments in strengthening grant administration included: (1) implementation of the restructuring of NSF's Cost Analysis and Audit Resolution Branch into two separate units focused on pre- and post-award functions to better address continuing growth in complexity and breadth of oversight functions; (2) continuation of a multi-year effort to modernize NSF's Award System, which included implementation of functionality that enables program staff to seamlessly manage \$860 million in funding increments to over 4,600 awards; and, (3) successfully piloting a new tool, Targeted Review Assessments (TRAs), that allows NSF to quickly assess areas of grants management and compliance, and to provide targeted necessary business assistance to the awardee community.

Challenge 1

Implement controls over spending of grant funds that ensure transparency and accountability without unduly adding to the administrative burden of awardees and federal program officers.

Progress Made in FY 2017

- Fully implemented inter-agency Research Terms & Conditions (RTCs), in accordance with requirements of OMB's *Uniform Administrative Requirements, Cost Principle, and Audit Requirements for Federal Awards (Uniform Guidance)*. RTCs create greater consistency in the administration of federal research awards and reduce awardee administrative burden.
- Refined and conducted FY 2017 baseline award monitoring of financial transactions across NSF's grant portfolio; explored feasibility of strengthening integration of baseline and advanced monitoring activities; and initiated baseline monitoring review of grants with little or no NSF's significant financial activity.
- Continued Federal Awardee Performance and Integrity Information System (FAPIIS) implementation. Issued the final Standing Operating Guidance for Pre-Award Reviews and Posting Terminations to ensure compliance in accordance with the *Uniform Guidance*.

Future Implementation Milestones

- For FY 2018, NSF will initiate a fraud risk assessment within the grants program, continue to refine its Enterprise Risk Management (ERM) risk profile, and complete an improper payments risk assessment. As part of the fraud risk assessment NSF will explore opportunities to leverage data analytics to enhance monitoring activities and grants administration.

- Continue to implement legislative requirements: 1) standardization and publishing of reports and data on federal spending under the DATA Act; and 2) reporting NSF information on undispersed balances in grant awards expired more than two years under the Grant Oversight and New Efficiency (GONE) Act.

Challenge 2

Take additional steps to oversee awardees that fall below the OMB Uniform Guidance Single Audit threshold of \$750,000 in total federal expenditures.

Progress Made in FY 2017

- Continued to fully implement the *Uniform Guidance* that raised the single-audit threshold to avoid duplication of effort across agencies, as well as created cost/time efficiencies and reduced administrative burden for awardees and the federal government. As intended under the *Uniform Guidance*, NSF focused efforts on organizations exposed to higher risk, reviewing as appropriate awardee records required for review by federal agencies, pass-through entities, and GAO throughout a broad array of pre- and post-award oversight efforts, especially advanced and baseline award monitoring activities.
- Conducted annual NSF Risk Assessment to assess level of risk associated with awardees' portfolios to identify institutions for advanced monitoring; complemented findings with results from prior institution-based oversight activities as well as concerns identified by NSF program offices and the OIG. Continued emphasis on institutions with \$2 million to \$15 million in NSF funds that have historically demonstrated more difficulty in administering NSF awards than those managing larger award portfolios.
- Conducted risk assessments of single audits for institutions receiving NSF funds to identify institutions with highest risk for more effective utilization of resources.

Future Implementation Milestones

Assess and, as needed, refine risk criteria (i.e., award-specific, institutional, prior monitoring activities and results, award administration, and program feedback) used in the annual NSF Risk Assessment to identify those awardees managing the highest risk portfolios, and targeting those institutions for advanced monitoring activities.

Challenge 3

Ensure prime grant recipients provide oversight of sub-recipients' incurred cost submissions to demonstrate costs are allowable, fair and reasonable.

Progress Made in FY 2017

- Piloted Targeted Review Assessment (TRA) methodology to assess compliance of 29 prime awardees' oversight of subrecipients per OMB *Uniform Guidance* (2 CFR 200.331). Provided feedback to awardees where minor issues were noted; required formal corrective actions for two awardees with more significant issues.
- Provided the OIG with a summary of TRA findings; shared 10 TRA results and files with the OIG to inform its audit of NSF oversight of prime awardees with subrecipients in accordance with the *American Innovation and Competitiveness Act*.

Future Implementation Milestones

- Review advanced monitoring subaward module for opportunities to upgrade assessment protocols based on TRA findings and *Uniform Guidance* requirements; as appropriate, incorporate feedback from OIG audit of NSF to enhance the subaward module for future oversight activities.
- Update DIAS fact sheet on subrecipient monitoring with links to *Uniform Guidance* requirements for

Performance

- pass-through entities (including risk assessment of all subrecipients) consistent with above bullets.
- Continue to require prime awardees to take corrective actions in cases requiring development and/or implementation of internal controls for subaward close-out, conduct of subrecipient risk assessments, and review of single audit reports ensuring compliance with OMB *Uniform Guidance*.

Encouraging the Ethical Conduct of Research

Lead: Office of the Assistant Director, SBE/OAD

NSF Management Overview

The responsible and ethical conduct of research is critical to ensure excellence, as well as public trust, in science and engineering. In accordance with Section 7009 of the America COMPETES Act (ACA) (42 U.S.C. §1862o-1) and recognizing the importance of ethical conduct of research, NSF requires that each institution submitting a proposal certify, under penalty of perjury, that it has a plan to provide appropriate training and oversight in the ethical conduct of research to all undergraduates, graduate students, and postdoctoral researchers who will be supported by NSF to conduct research. The plan must be available for review upon request and to ensure compliance, NSF includes, as a term and condition of its awards, that institutions are responsible for verifying that undergraduate students, graduate students, and postdoctoral researchers supported by NSF to conduct research have received training in the responsible and ethical conduct of research. NSF's implementation of the Responsible Conduct of Research (RCR) requirement recognizes the breadth of research disciplines the Foundation funds, as well as the diversity of the educational levels of the individual researchers the agency supports, to ensure that the training will be effective and appropriately tailored. Specific training needs may vary depending on specific circumstances of research or the specific needs of students intending to pursue careers in basic or applied science after completing their education. Accordingly, it is the responsibility of each institution to determine both the content and the delivery method for the training that will meet the institution's specific needs. Furthermore, each institution must decide if development of content or pedagogical method is required, or if appropriate content and training can be provided from some existing sources or capabilities, and take appropriate action to implement their decisions.

The National Academy of Sciences released a report on Fostering Integrity Research in the spring of 2017 that was supported by the Office of Inspector General of the National Science Foundation under Contract No. NSFCACS11P1173. The OIG Review of Institutions' Implementation of NSF's Responsible Conduct of Research Requirements was issued by the Office of Inspector General of the National Science Foundation. Both of these reports were discussed at the National Science Board in August 2017. NSF then issued an Important Notice No. 140 to Presidents of Universities and Colleges and Heads of Other National Science Foundation Grantee Organizations addressing Training in Responsible Conduct of Research – A Reminder of the NSF Requirement in August 2017. NSF and the NSB are committed to providing appropriate guidance to grantees and to ensuring the sharing of best practices in the responsible conduct of research.

NSF has been and continues to be actively engaged in enhancing the awareness of ethical conduct of research issues by NSF staff, as well as the U.S. and international scientific research and education communities by supporting the development of tools and resources to enhance the ability of research institutions to cultivate cultures of academic and research integrity. NSF's programmatic approach is a broad proactive measure that includes all Directorates in the funding of fundamental research that informs the scientific community and public about best practices in responsible conduct of research. Most notably, the Online Ethics Center (OEC) provides resources, including an Ethics Education Library that institutions can use to deliver effective training that is tailored to meet the needs of their research projects. NSF's cross-directorate program in which all NSF Directorates actively participate, Cultivating Cultures for Ethical STEM (CCE STEM), invests in innovative approaches to enhance research into ethical conduct of research issues that can build the capacity of institutions to develop appropriate ethical conduct of research plans as required by the America COMPETES Act. NSF is actively engaged in heightening the U.S. and international STEM community's awareness of these resources.

Performance

Challenge

Provide more oversight on institutional implementation of Responsible Conduct of Research (RCR) requirements and provide meaningful guidance regarding RCR training.

Progress Made in FY 2017

- Issued an Important Notice No. 140 to Presidents of Universities and Colleges and Heads of Other National Science Foundation Grantee Organizations addressing Training in Responsible Conduct of Research – A Reminder of the NSF Requirement in August 2017.
- Continued to support research that provides answers to questions about creating responsible research communities.
- Funded 28 awards in three Directorates under the Robust and Reliable Science Dear Colleague Letters.
- Continued to share state of the art understanding of what approaches are most effective in outreach opportunities with NSF staff and the U.S. and international scientific research and education communities.
- Continued funding of the Online Ethics Center (OEC) website. OEC provides online resources to engineers, scientists, faculty, students and the public to understand and address ethically significant issues that arise in scientific and engineering practice and from new developments in science and engineering.
- Hosted a CCE STEM Principal Investigators' Meeting for researchers working on ethics and the responsible conduct of research (September 2016).
- Funded the workshop on “Qualitative Research Ethics in the Big-Data Era” in Arlington, VA (December 2016) held by Pennsylvania State University. The goal of the workshop was to contribute to improved understanding of issues arising from ethical management of big qualitative datasets in academia and in other national and international institutions that finance and conduct qualitative research. A special issue is being planned and developed to be published in 2018 in *American Behavioral Scientist*. The focus of the special issue is to advance a set of recommendations and guidelines for accountable and ethical management of qualitative data.
- Funded the workshop on “Positive Research Integrity” at the University of Notre Dame, IN (March 2017). The goal of the workshop was to assemble researchers and practitioners of positive ethics, research integrity, philosophy, moral psychology, and character education to discuss how research integrity is perceived as both a research and educational area. A workshop summary and white paper will be produced and disseminated.
- Funded the workshop on “Enhancing robustness and generalizability in the social and behavioral sciences” in Arlington, VA (March 2017) held by Northwestern University. The goal of this workshop was to develop some tools and guidelines to help researchers overcome barriers to broader sampling, and to incentivize doing so through better institutional support. A Sackler Colloquium entitled, “Pressing questions in the study of psychological and behavioral diversity”, (September 2017) based upon the workshop will have its papers published in the Proceedings of the National Academy of Sciences.
- Funded an ADVANCE Partnership project designed to transform teaching of research ethics of current and future geoscientists by addressing sexual harassment as scientific misconduct.
- Funded a proposal, “RCN-UBE Incubator: Consortium for the Integration of Ethical Research Practices into Course-based Undergraduate Research Experiences in the Biological Sciences”, at the University of Texas at El Paso to explore ethics and responsible conduct of research within the biological sciences.
- Funded an EAGER proposal on “Ethical and Methodological Challenges in Social Media Research” at Texas State University - San Marcos to explore the ethical and methodological challenges of conducting human subjects research when recruitment is solicited through social media accounts.
- Participated in Responsible Conduct of Research outreach (SBE leadership) at Howard University (July 2017).
- Continued monitoring and oversight of CCE-STEM program activities, which included responsible

conduct of research in STEM funding of one workshop at the University of California-Riverside; two institutional transformation grants, one at Virginia Polytechnic Institute and State University and the second at Indiana University; and four standard research grants covering scientific research writing; ethical research culture with community engagement; evaluation of RCR training; and different ethical orientations in STEM.

- Initiated NSF practice requiring the agency's Chief Operating Officer to review research misconduct cases as they are identified.

Future Implementation Milestones

- Continue to support and share research that provides answer to questions about creating responsible research communities, robust and reliable science, and best practices for ethical STEM.
- Analyze the outcomes of the three workshops funded in FY 2017, which will include: (1) structured guidance for addressing the well-documented sampling bias that will contribute to broadening the sampling protocols for experimental behavioral science research; (2) a white paper on in critical thinking skills, recognizing ethical issues, navigating difficult situations, and cultivating interpersonal and communication skills for supporting positive research integrity; and (3) a set of recommendations and guidelines for accountable and ethical management of qualitative data.
- Invite an SBE Distinguished Lecturer to NSF to speak on the responsible conduct of research.
- As more research becomes available on best practices and factors influencing and shaping cultures of research integrity, NSF will develop as needed guidance for institutions concerning the range of appropriate training approaches.
- Evaluate themes and common threads of identified misconduct cases, and compile and evaluate grantees' common responses to these cases and needs for additional RCR training.