

## **FY 2016 MANAGEMENT CHALLENGE PROGRESS REPORT**

This section provides NSF's progress report highlighting the significant actions taken in FY 2016 on the management challenges identified by NSF's Inspector General at the beginning of that fiscal year.

### **Establishing Accountability over Large Cooperative Agreements**

Lead Official: Branch Chief, Cooperative Support Branch, Division of Acquisitions and Cooperative Support, Office of Budget, Finance, and Award Management (BFA)

#### **NSF Management Overview**

The Office of Inspector General (OIG) challenge relates to NSF's oversight of large facilities construction awards. The Foundation currently utilizes end-to-end oversight policies and procedures to ensure adequate stewardship over federal funds for both construction and operations. These activities are carried out starting with the day-to-day oversight of 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 Audit Resolution Branch (DIAS/CAAR) which supports cost analysis, award and post-award monitoring.

NSF has been continuously enhancing its pre-award and post-award oversight of large facilities cooperative agreements 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 of the National Academy of Public Administration (NAPA) supported NSF's use of cooperative agreements. However, the report also noted that NSF should equally emphasize increased internal management of the business practices critical to the enhanced oversight and project success in order to bring them into equal balance with the science and technical aspects of the project. NSF agrees with the spirit of all of the NAPA recommendations and plans to accommodate them in some form. One key step forward is that in March 2016, NSF completed the process for selecting a new managing organization for the NEON project, Battelle Memorial Institute. The turnaround of the NEON project reflects NSF's quick action to restore confidence in the oversight of the project and to ensure sound financial and technical oversight in bringing the construction portion of the project to completion.

#### **Challenge 1**

Establish accountability for the billions of federal funds in NSF's large cooperative agreements at the pre- and post-award stages and throughout the lifecycle of projects, and validate that the strengthened policies are implemented and working.

#### Progress made in FY 2016

- Implemented NAPA Recommendation 6.5: Hiring of two additional full-time equivalent (FTE) staff in LFO and making the LFO Head, a voting member on the MREFC Panel.
- Formed a Business and Operations Advisory Committee (BOAC) subcommittee on NAPA implementation. Specifically, the subcommittee is charged with providing options for appropriate agency-wide oversight for the NSF O/D by among other things, addressing two NAPA recommendations (Recommendations 6.2 and 6.4) dealing with: 1) the need for the NSF Director to have access to independent advice to serve as a sounding board for objective insight on large research

projects; and 2) a potential re-scoping of the role, duties, and membership of the MREFC Panel to include status update reviews of projects in the development and construction phases focusing on cost, schedule, and performance.

- Conducted a workshop with NSB to clarify roles and responsibilities with regard to large facilities oversight to address NAPA Recommendation 6.1 & 6.6: Clarifying oversight roles and use of annual NSF Facilities Plan, respectively.
- Implemented v1.0 of the NSB Facilities Portal as possible replacement to NSF Facilities Plan.
- Developed a certification, training, and core competency implementation plan for NSF staff engaged in large facilities oversight as part of the FY 2016 NSF Strategic Objective Review to address NAPA Recommendation 6.7: Project Management skill requirements.
- Drafted the joint LFO-DACS/CSB narrative for internal controls testing of enhanced policies and procedures related to large facilities oversight.
- Implemented appropriate/applicable enhanced oversight mechanisms currently used for construction awards on operational awards.
- Conducted Earned Value Management System (EVMS) verification/validation of the Large Synoptic Survey Telescope (LSST) project.

#### Future Implementation Milestones

- Develop and implement new SOG for conducting NSF EVMS verification/validation reviews.
- Develop new SOG on stage-gate and construction reviews to address NAPA Recommendation 6.3: Financial and project management expertise on panels.
- Develop new SOG on training, certification, and core competencies for NSF staff engaged in large facilities oversight.
- Complete EVMS verification/validation on Daniel K. Inouye Solar Telescope (DKIST) and Regional Class Research Vessel (RCRV) projects.
- Work with BFA's Division of Financial Management (DFM) under the Process Improvement Plan for the FY 2015 financial statement audit to test and evaluate new narrative and supporting procedures in accordance with OMB Circular, No A-123, "Management's Responsibility for Internal Control."

#### **Challenge 2**

Ensure that costs proposed for and incurred under its large facility projects, such as LSST and NEON, are fair and reasonable, and that the agency's cost surveillance practices are sufficient to identify: unallowable or unreasonable expenditures, funds spent for awards other than those for which they were provided, or potential cost overruns.

#### Progress made in FY 2016

- Implemented NAPA Recommendation 3.1: Exceptions to Cost Analysis (revisions to BFA SOG 2016-4).
- Implemented NAPA Recommendation 4.1: Retain control over a portion of budget contingency (BFA SOG 2016-2).
- Implemented NAPA Recommendation 4.2: Require Recipient use of U.S. Government Accountability Office (GAO) cost estimating and scheduling guides (LFM Section 4.2).
- Conducted detailed analysis on use of management fee to address NAPA Recommendation 4.3: Elimination of management fee.
- Implemented contract mechanisms to support independent cost estimate reviews (per GAO) for construction and operations.
- Implemented contract mechanism for incurred cost, accounting system and estimating system audits.
- Developed incurred cost submission tool for recipients specific to supporting incurred cost audits on cooperative agreements governed under the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance).
- Completed DKIST budget and schedule contingency review.

- Initiated Independent Cost Assessment (per GAO) of Antarctic Infrastructure Modernization for Science (AIMS) in support of the Preliminary Design Review planned for December 2016.
- Completed NSF cost analysis of the Battelle estimate to complete NEON construction, including Independent Cost Estimate (per GAO).
- Developed Corrective Action Plans (CAPs) for LSST and DKIST projects in response to OIG Alert Memos.

Future Implementation Milestones

- Provide analysis of options on use of management fee for NSF Leadership consideration in setting Foundation policy on management fee going forward.
- Develop and implement new SOG for selection of appropriate independent cost estimate review in accordance with the GAO Cost Estimating and Assessment Guide.

## **Management of NSF's Business Operations: Improper Payments**

Lead Official: Division Director, Division of Financial Management, BFA

### **NSF Management Overview**

In June 2015, the NSF OIG issued an audit report that found NSF non-compliant with the Improper Payments Elimination and Recovery Act (IPERA) for FY 2014. The OIG specified that NSF did not address all of the required OMB Circular A-123 Appendix C improper payment risk factors and that the quantitative portions of the risk assessment did not maintain statistical validity. The OIG recommended that NSF conduct a statistically valid sampling process in order to estimate an improper payments rate. NSF did not believe it was non-compliant with IPERA for FY 2014; nor did NSF agree to conduct additional IPERA statistical sampling. However, NSF did consider the results of the OIG report carefully and performed additional IPERA risk assessment work in FY 2015. Additionally, NSF conducted a series of meetings with the OIG and OMB in order to reach consensus with the OIG on NSF's efforts to insure compliance with IPERA.

### **Challenge**

Develop an internal control process that provides reasonable assurance that payments are proper at the time they are made; and develop a sound process for assessing the agency's risk of improper payments.

### Progress made in FY 2016

- Completed a process improvement plan, during October 2015, in response to the OIG IPERA audit report.
- Completed a qualitative improper payments risk assessment in December 2015 covering FY 2015.
- Received OIG-issued inspection report in May 2016, based on its review of the FY 2015 risk assessment, concluding that NSF is compliant with IPERA reporting requirements for FY 2015.
- Considered all areas for improvement in NSF's IPERA risk assessment process that had been identified in the OIG inspection report.
- Completed and submitted a CAP in July 2016 to address the audit findings from the OIG report. In August 2016, the OIG reviewed the CAP and found it responsive to their recommendations. All recommendations were resolved.
- Completed a policy and procedure document in September 2016 for future IPERA risk assessments (pursuant to the CAP).

### Future Implementation Milestones

- Complete future IPERA risk assessments on a three-year cycle and report results in FY 2018.
- Consider award financial monitoring testing results as an input for the qualitative IPERA risk assessment.

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

Lead Official: Division Director, Division of Information Systems, Office of Information and Resource Management (OIRM)

### **NSF Management Overview**

NSF is aware that the security posture of its information systems is of critical importance to NSF's ability to carry out its mission. 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. NSF ranks seventh out of the 24 CFO Act agencies in cybersecurity assessment scores in the most recent annual FISMA report to Congress.

### **Challenge**

Allocate appropriate resources to correct IT security weaknesses, particularly relating to the U.S. Antarctic Program (USAP) and provide increased assurances of adequate protection; and develop and implement a robust information security continuous monitoring (ISCM) program that protects agency information and IT resources against increasing numbers of IT security threats.

### Progress made in FY 2016

- US Antarctic Program (USAP)
  - USAP continued to allocate appropriate resources to the IT security program to address information security weaknesses identified in the annual FISMA review.
  - USAP improved the analysis of system scans to ensure configuration compliance and reviewed processes to ensure proper background investigations on all new hires.
  - NSF's Division of Polar Programs established a phased approach to address an improved continuity of operations capability.
- Information Security Continuous Monitoring (ISCM)
  - Initiated implementation of the Continuous Diagnostics and Mitigation (CDM) Phase 1. NSF will be the first federal agency to complete implementation of the CDM Phase 1 in Quarter 1 FY 2017.

### Future Implementation Milestones

- USAP: Continue to address identified IT security weaknesses through program funding.
- ISCM: Utilize CDM Phase 1 products and services (focusing on tools implementation) to improve its automated continuous monitoring capability.

## **Management of NSF's Business Operations: Transparency & Accountability**

Lead: Office of the Director

### **NSF Management Overview**

NSF is well-positioned to successfully implement the Digital Accountability and Transparency (DATA) Act. 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 even prior to its enactment in April 2014. When the legislation passed, NSF moved immediately to leverage its resources to prepare for implementation. In October 2014, NSF designated a senior official in its Office of the Director (O/D) to serve as the agency's DATA Act Senior Accountable Official (SAO). The SAO identified subject matter experts in BFA and the Office of Information and Resource Management (OIRM) for implementation support and the group formed 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). Additionally, NSF engaged its OIG to facilitate collaboration around stewardship and in recognition of the OIG requirement to publish a DATA Act readiness review by November 2016, and OIG staff have regularly attended DAWG meetings.

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 Working Group, a volunteer subgroup of the FACE charged with performing analyses and 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's DATA Act implementation has adhered to applicable DATA Act guidance issued by OMB and Treasury. In particular, implementation at NSF is guided by the government-wide DATA Act Implementation Playbook Version 2.0 that tracks the 8-Step Implementation Approach with implementation status reported via the associated OMB/Treasury Dashboard. NSF uses a phased iterative approach to update current processes for reporting procurement and financial assistance information to USASpending.gov using the Award Submission Portal (ASP), and has instituted new processes to produce and upload required account-level budget, spending, and award information. NSF leverages government-wide solutions and resources that are made available for implementation.

NSF is actively taking steps to mitigate risks or challenges and is employing multiple approaches to ensure on time compliance. No major system changes have been identified in order for NSF to meet the deadline. Going forward, to ensure adequate resources are available for a successful and on time implementation, the DAWG will continue to foster strong internal, executive-level and government-wide communication. NSF will also continue to communicate its challenges and needs to OMB and Treasury.

### **Challenge**

Foster greater transparency over NSF spending through successful implementation of the Digital Accountability and Transparency Act (DATA Act) to make the necessary NSF system and process changes.

### Progress made in FY 2016

- Performed inventory of agency data and associated business processes.
- Participated in government-wide effort to implement OMB Circular A-11 DATA Act requirements and successfully submitted NSF A-11 test files to the OMB MAX system.

- Participated in “sandbox” testing to test Treasury’s DATA Act Broker, the tool it developed to check validity of federal agencies’ uploaded files and provides ability for agencies to certify their data.
- Revised future state of NSF’s daily, bi-monthly and quarterly reporting based on the Broker specifications and final technical guidance DATA Act Information Model Version 1.0 (DAIMS v1.0) released April 29, 2016.
- Submitted to OMB/Treasury NSF’s update to the agency’s August 28, 2015 DATA Act Implementation Plan to show progress to date, incorporated additional guidance provided by OMB/Treasury, and provided revised cost and timeline estimates. Also submitted implementation plan updates to other governmental entities, e.g. Congress, OIG.
- Implemented data extract changes in iTRAK, NSF’s financial accounting system, as well as in NSF business applications.
- Developed a back-up approach to meeting DATA Act deadline to mitigate the risk of Oracle patches not being delivered in enough time for testing and implementation.
- Participated in DATA Act Broker beta testing.

#### Future Implementation Milestones

- Generate and test Award Submission Portal (ASP) data file per Treasury’s new specifications.
- Comply with ASP submission requirements to USASpending.gov.
- Make changes to eJacket and iTRAK to accommodate the change in budget object class from 410100 (Personnel Mobility Program) to 118500 (IPA Salary and Fringe Benefits).
- Implement Oracle patch for award attributes (first of five anticipated patches) and modify 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).
- Upload financial assistance and procurement files to populate the award attributes in iTRAK.
- Implement remaining Oracle patches and generate the files that will be required to submit to the 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)].
- Generate files A, B, and C using the implemented Oracle patches.
- Perform Broker testing by uploading agency generated files A, B, and C.
- Perform 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).
- Perform Broker testing in order to validate files A through F to facilitate certification of NSF’s data.
- Implement the back-up approach, as needed, to generate files A, B, C, and reconciliation reports to mitigate the risk of not having the Oracle patches ready for the DATA Act compliance by May 2017.
- Achieve compliance with May 2017 DATA Act implementation deadline.

## **Management of NSF's Business Operations: Government Records**

Lead Official: Division Director, Division of Administrative Services, OIRM

### **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," consistent with a 2011 Presidential Memorandum, requiring federal agencies to reform the policies and practices for the management of records and provide a framework for the management of electronic records. GAO subsequently issued Report 15-339, dated May 14, 2015, titled, "Information Management: Additional Actions Are Needed to Meet Requirements of the Managing Government Records Directive."

NSF formulated a CAP in response to the GAO report and is on schedule to meet all the planned actions enumerated in the CAP.

### **Challenge**

Respond to GAO's recommendations related to NSF's records management policies and practices, and comply with the National Archives and Records Administration's (NARA) 2012 directive to take specific reform actions by appointed dates.

### Progress made in FY 2016

- Submitted a CAP in November 2015 in response to the GAO Report 15-339, "Information Management: Additional Actions Are Needed to Meet Requirements of the Managing Government Records Directive."
- Deployed the eRecords Awards Archival System in February 2016 for the documentation and management of permanent electronic grant records. Because grant records are one of the most critical types of agency records, this activity will constitute a significant component of NSF's plan for achieving full compliance with OMB M-12-18.

### Future Implementation Milestones

- Formalize plans to manage other types of electronic records and make progress towards identifying the necessary revisions to current records management policy, technology requirements, and potential solutions.
- Ensure execution of the comprehensive plan and implementation strategy managing permanent records electronically.
- Formalize NSF plans to implement the Capstone approach, a government-wide approach for managing permanent and temporary e-mail records in an electronic format. OIRM will identify any necessary revisions to current records management policy; assess technology requirements and potential solutions; and develop the implementation strategy that will ensure NSF meets the December 31, 2016 deadline

## **Management of the Intergovernmental Personnel Act (IPA) Program**

Lead Official: Deputy Division Director, Division of Human Resource Management, OIRM

### **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. 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.

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 policy on NSF's use of IPAs and oversees common approaches to budgeting and implementation of the IPA program.

### **Challenge 1**

Examine the costs associated with NSF's rotator programs to ensure that federal funds entrusted to the agency are being spent effectively and efficiently.

#### Progress made in FY 2016

- Established IPA Steering Committee (detailed description set forth under Challenge 2).
- Submitted Steering Committee reports to Director Córdova in August 2016, which, among other things:
  - Summarized the Steering Committee's analysis of costs related to salaries, benefits (including relocation benefits), and individual research and development (IR/D) travel and benchmarking with other federal science agencies;
  - Recommended the development of an integrated agency-wide workforce framework to ensure that NSF maintains the optimal balance of federal employees and IPAs;
  - Identified strategic cost saving areas requiring additional stakeholder consultation, including institutional cost sharing; and
  - Identified strategic cost saving areas that could be examined concurrently with the development of an agency-wide framework.
- Documented plans for the IPA Steering Committee to serve as the lead to carry out NSF's commitment to review the overall IPA program and associated costs and benefits every four years and assess the impacts of actions taken to reduce IPA costs. This review and assessment is part of NSF's corrective action plan that responds to the OIG's Cost of IPAs audit.

#### Future Implementation Milestones

- Complete, via IPA Steering Committee task groups, a plan to establish an agency-wide workforce framework and recommendations for the potential use of new or additional hiring authorities in support of that framework.
- Ensure IR/D guidance (planned for implementation in FY 2017) supports the goal of combining IR/D with telework, where appropriate, to maximize the use of travel funds.
- Implement approved changes to NSF's policies for the reimbursement of IPA costs identified in OMB M-12-18.

### **Challenge 2**

Establish and maintain strong oversight of NSF's Intergovernmental Personnel Act (IPA) program in order to provide continuity for programmatic leadership despite frequent turnover in executive positions, to

manage potential conflicts of interest in funding decisions, to promote transparency in funding decisions, and to ensure that IPAs and other rotators comply with federal laws after they leave NSF.

Progress made in FY 2016

- Established IPA Steering Committee with specific responsibilities to include championing the effective use of IPAs and the importance of addressing management risks; reviewing policies concerning IPA assignees, policies impacting IPA assignees, and policies where the use of IPAs may impact the implementation of those policies; reviewing data on IPAs to inform the Committee's oversight duties; coordinating the development of an NSF-wide budget for the IPA program; and providing guidance on methods for managing to the overall budget while ensuring a diverse, high quality cadre of IPAs.
  - As of September 30, 2016, the IPA Steering Committee met nine times and submitted one initial and two revised reports on managing IPA costs and developing an integrated workforce framework to Director Córdova.
  - The IPA Steering Committee developed strategic principles for management of the IPA program: community engagement, partnership, creativity, transparency, accountability, intentional balance in the workforce structure, and commitment to ongoing improvement.
- Continued identification and management of conflicts of interest related to IPAs:
  - Communicate standards of conduct—IPAs are subject to the same ethics rules as everyone else who works at NSF:
    - Standards of conduct are communicated in the IPA agreement.
    - New employees, including IPAs, attend new employee orientation and are briefed on the ethical obligations of Federal service.
    - IPAs file a financial disclosure report: all financial disclosure report filers, including IPAs, receive annual Conflict of Interest (COI) training. After filing a financial disclosure report, filers including IPAs receive a written reminder of the COI rules.
  - Track conflicts – Each COI official tracks conflicts in writing or through eJacket.
  - Ensure continued compliance with Federal laws after leaving NSF:
    - Employees, including IPAs, who are at or above the GS-12 salary level or equivalent, are required to attend a COI exit briefing by the Office of the General Counsel (OGC) Ethics Team explaining the post-employment ethics rules.
    - Former employees, including former IPAs, are encouraged to contact the Ethics Team even after they leave.
- Developed and piloted a one-day course, “Oversight of Merit Review for Division Leaders,” to provide NSF Division Leaders, including IPAs, mission-critical information on their role in providing oversight of the NSF Merit Review process. Topics include: Overview of the Proposal & Award Process, Key Roles and Responsibilities in Merit Review, Role of Division Leadership in Ensuring Fairness of Review, How Program Officers Make Recommendations, The Review Analysis, and Understanding Recommendation Logistics and Award Abstracts.

Future Implementation Milestones

- The IPA Steering Committee will:
  - Review and update core policies relating to IPAs, as found in the NSF Personnel Manual, as needed;
  - Establish a framework for and review data on IPAs for oversight of management of the program;
  - Coordinate the development of an NSF-wide budget for the IPA program as part of the annual budget cycle; and
- Ensure that periodic data is provided to the directorates and offices on the completion of mandatory training and status of performance plans and appraisals.

## **Moving NSF Headquarters to a New Building**

Lead Official: Senior Relocation Project Officer, OIRM

### **NSF Management Overview**

NSF is well-positioned to begin occupying its new location in Alexandria, Virginia by August 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 has made significant progress in key areas to ensure project success and to mitigate risks relating to scheduling delays, union negotiations and records management. NRO has also taken concrete steps to align the project's budget with its estimated cost.

The groundbreaking for the new NSF Headquarters was January 2014, construction on the interior space began in April 2016 and work will finish by August 2017. The new building will prominently reflect NSF's role nationally and internationally in the science and engineering community.

### **Challenge 1**

Mitigate the risk of continued project delays associated with a revised relocation schedule that includes little slack time and two phases of union negotiations that still need to be completed.

### Progress made in FY 2016

- Working with GSA, settled the owner's delay claim from \$60 million down to \$14.5 million and reset the project schedule.
- Finalized all design documents in accordance with the revised project schedule and without delay.
- Along with GSA, awarded a \$70 million contract for tenant improvement construction.
- Brought on a full-time, professional project scheduler who developed an Integrated Project Schedule that identifies the project's critical path, assigns responsibility, and forms the basis for tracking progress.
- Ensured all procurements were awarded in accordance with the Integrated Project Schedule, including information technology, furniture, security, and audio-visual contracts.
- Managed FY 2016 relocation-related procurement activities; ensured that the FY 2016 and FY 2017 procurement and budget schedules supported and aligned with the projected relocation timeline.
- Added two project managers with office relocation experience to the NRO team.
- Hired a professional cost estimating and construction quality management firm to prepare detailed costs estimates for major submittals and requested change orders.
- Completed Phase 2 negotiations with AFGE Local 3403 without negatively impacting the project schedule.
- Started employee workspace selections in accordance with the Phase 2 union agreement and Integrated Project Schedule.
- Briefed senior leadership on value-engineering options, and drove decisions that control costs and provide a functional headquarters that helps NSF meet its mission.

### Future Implementation Milestones

- Further develop the Integrated Project Schedule and continue to meet regularly with OIRM leadership to manage the project, monitor progress, mitigate risks, and allocate resources.
- Maintain bi-weekly procurement meetings with DACS to ensure all procurements are made without negatively impacting the project schedule.

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- Complete the third phase of negotiations with AFGE Local 3403 without delaying the project schedule.
- Finalize employee workspace selections and order all furniture, fixtures, and equipment according to the project schedule.

### **Challenge 2**

Plan for and manage the logistics of the actual move to the new headquarters building, including addressing the lack of a detailed master schedule, having to negotiate with the union on furniture and space issues, fewer opportunities for design review, less storage space, lack of a records schedule for destruction of documents and lack of a responsible project person with direct access to the Director.

### Progress made in FY 2016

- Determined the strategy to move employees into the new building in accordance with the project schedule. Communicated plan with senior leadership, AFGE, and directorates.
- Engaged OIRM essential senior staff to centralize relocation planning and identify potential move-related cost-impacts.
- Determined phasing for the move based on current and new building constraints and other major move assumptions associated with IT, furniture, elevator, dock availability, etc.
- Hired two full-time contractors to gather and analyze key data impacting the move plan, as well as develop two relocation sequence options for leadership's consideration.
- Announced to NSF staff the move sequence to Alexandria.

### Future Implementation Milestones

- Key activities leading up to August 2017 relocation:
  - Develop detailed relocation plan.
  - Determine furniture for reuse and associated migration plan.
  - Develop furniture, fixtures and equipment decommissioning strategy.
  - Develop welcome guide/employee orientation requirements.
  - Establish new building protocols and policies.
  - Establish move communication program for end users.
  - Develop migration plan for division equipment.
  - Decommission existing facilities.

## **Management of the U.S. Antarctic Program**

Lead Official: Division Director, Directorate for Geosciences, Division of Polar Programs

### **NSF Management Overview**

Through the Division of Polar Programs (PLR) 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**

Establish and maintain a world-class scientific research program in Antarctica's remote and harsh environment.

#### Progress made in FY 2016

- Continued progress on the 2012 Blue Ribbon Panel (BRP) recommendations, including investment in prioritized lifecycle acquisitions and infrastructure upgrades.
- Addressed major infrastructure upgrades recommended by the BRP report for McMurdo Station through continued design efforts:
  - Continued designs of Core Facility and Utilities packages in preparation for the Antarctic Infrastructure Modernization for Science (AIMS) project MREFC Preliminary Design Review (PDR).
  - Initiated design efforts using NSF Research and Related Activities (R&RA) funds for upgrades to McMurdo lodging, Vehicle Equipment/Operations Center, Information Technology & Communications (IT&C) Primary Operations Center, and Palmer Pier replacement.

#### Future Implementation Milestones

- Complete necessary planning/design efforts for individual Antarctic Infrastructure Modernization for Science (AIMS) components.
- Complete designs for Palmer Pier, lodging, and IT&C Primary Operations Center.
- Prepare for AIMS External Panel Review.
- Complete planning/design for the Ross Island Earth Station (RIES).

### **Challenge 2**

Control the cost of the USAP and ensure adequate oversight of payments to the USAP contractor.

#### Progress made in FY 2016

Continued to review and approve and/or adjust, as warranted, invoices to the USAP contractor. Prior to approval, invoice review is done by staff whose primary responsibility is review and resolution of invoiced amounts with the contracting officer and contracting officer's representative, a documented process initiated in FY 2013.

#### Future Implementation Milestones

Continue to monitor invoices from the USAP contractor in accordance with established procedures.

### **Challenge 3**

Ensure the overall health and safety of all USAP participants.

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### Progress made in FY 2016

- Pharmacy System: Instituted internal controls to address OIG concerns related to potential drug allergies and interactions and provided assistance in getting information on prescribed drugs. A pharmacy technician was deployed to McMurdo Station during the 2015/16 operating season to review the current state of the pharmacy and its management. The pharmacy system was revitalized and repairs were made to the database that is currently in use.
- Law Enforcement: Achieved full compliance of NSF's law enforcement program with all U.S. Marshals Service requirements for certification and training, and recommendations for law enforcement tools made by the Service.
- Breathalyzer Unit Calibration: Procured breathalyzer units that do not require calibration. These units provide redundancy for the existing breathalyzer inventory.

### Future Implementation Milestones

- Code of Conduct: Finalize a process for receiving and reviewing Code of Conduct violations.
- Pharmacy System: Identify a suitable system responsive to NSF's contractor's proposal to procure a new pharmacy system.
- Law Enforcement: Plan for a 2016/17 site visit to Antarctica, resources and schedules permitting. PLR has had internal conversations with OGC and will reach out to law enforcement organization contacts shortly. Post-site visit, expect to identify any desired changes and target implementation for the following season.
- Breathalyzer Testing Requirements: Continue 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 planned for FY 2016/17.

## **Improving Grant Administration**

Lead Official: Deputy Division Director, Division of Institution and Award Support, BFA

### **NSF Management Overview**

As of June 30, 2016, the NSF award portfolio consisted of 42,206 active awards, representing \$28.2 billion in obligated funds to 2,873 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 in order to identify exceptions and potential issues that may require further scrutiny through advanced monitoring. The baseline monitoring efforts of DFM can reveal potential financial anomalies, inaccurate expenditure reporting, or evidence of a possible misunderstanding of, or non-compliance with, federal cash management requirements and/or NSF guidelines.

During FY 2016, NSF and the OIG agreed to expand the scope of their formal dialogue across activities that now span external audit resolution, large facilities, contracts, financial statement audit issues, as well as internal and performance audits. NSF continues to expand and upgrade mechanisms for communicating policies, procedures, and business practices within this dynamic environment to its staff and external stakeholder communities. In FY 2017, NSF will restructure its Cost Analysis and Audit Resolution Branch into two separate organizations (pre-award, post-award) to strengthen effectiveness of grants oversight to meet the growing need for deeper subject matter expertise, improved resource utilization, and strategic planning.

### **Challenge 1**

Implement controls over spending of grant funds that ensure transparency and accountability without creating undue administrative impacts on awardees and federal program officers.

#### Progress made in FY 2016

- Coordinated inter-agency development and clearance of Research Terms & Conditions, which implement the Uniform Guidance issued by OMB. This effort creates greater consistency in the administration of Federal research awards and reduces awardee administrative burden by having one standardized set of terms and conditions to comply with, instead of disparate sets from each research agency. This also allows the Federal research agencies to manage awards in a similar fashion.
- Expanded integration of NSF's new financial and awardee payment process systems to further data transparency and decision-making, as well as to provide real-time cash transaction and funds control capabilities.
- Implemented baseline award monitoring of financial transactions to assess allowable costs associated with grant payments, utilizing statistically-based testing and NSF Risk Assessment results as stratification criteria to ensure coverage across the grant portfolio. This process improved transparency and accountability by enabling DFM to use a statistically based sample size that resulted in requiring fewer test samples, which subsequently reduced the burden on those grantees who must provide documentation to support the payments being tested.

## *FY 2016 Management Challenge Progress Report*

- Initiated the development of a new baseline monitoring activity for financial transactions to review grants with high unliquidated balances and short remaining grant periods, which will be used to develop new baseline monitoring metrics.
- Converted Small Business Innovation Research (SBIR) Phase I grants (with start dates as of July 1, 2016) and SBIR Phase II grants (with start dates as of August 1, 2016) to the Award Cash Management Service (ACM\$) to minimize manual processing and leverage ACM\$ funds control capabilities, which will allow for improved transactional accuracy due to automating the process and for quicker, more expeditious processing of SBIR drawdowns for grantees.
- Implemented use of the Federal Awardee Performance and Integrity Information System to ensure transparency and accountability of performance in federal assistance awards.
- Continued to strengthen working relationships among NSF program officers, NSF grants and oversight officials, and the NSF OIG to address significant issues related to allowability, allocability, and reasonableness of funds expended in the conduct of research.

### Future Implementation Milestones

- Refine, as necessary, and conduct FY 2017 baseline award monitoring of financial transactions across NSF's grant portfolio; explore feasibility of strengthening integration of baseline and advanced monitoring activities; initiate baseline monitoring review of grants with little or no financial activity.
- 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**

Due to federal streamlining of written guidance for administering grants, ensure provision of consistent guidance that does not contradict previous responses or written policies.

### Progress made in FY 2016

- Ensured continued alignment of advanced monitoring efforts with *OMB Uniform Guidance (UG)*, as well as that of external websites, fact sheets, and other information provided to NSF awardees.
- Provided training to NSF program staff on major revisions to the *Proposal & Award Policies & Procedures Guide (PAPPG)*, *Proposal & Award Manual (PAM)*, and NSF grant conditions. To reach a broader audience, training was provided both in-person as well as with an increased virtual presence.
- Increased in-person training and outreach at conferences and workshops sponsored by research administration professional societies allowing for more effective, real-time interaction with the community; and continued virtual training opportunities such as the webcast of the NSF Grant Conference, which allowed for on-demand viewing of sessions covering proposal preparation, merit review, award management, the CAREER program, as well as updates to NSF policies and procedures.
- Expanded automated Proposal Compliance Validation (PCV) checks by ensuring that proposals submitted to NSF comply with requirements specified in the FY 2016 *Proposal & Award Policies & Procedures Guide* (Chapter II.C.2 of the GPG). The new system enhancements check the following requirements and may trigger either an error or warning message depending on the funding opportunity type:
  - Proposals must be received by 5 p.m. submitter's local time on the established deadline date.
  - Biographical Sketch(es) and Current and Pending Support files are required for each Senior Personnel associated with a proposal.
  - Biographical Sketch(es) can only be uploaded as a file, must not exceed two pages, and can no longer be entered as text.
- The goal of automated compliance checking is to reduce the administrative burden on the research community and NSF staff while ensuring fair and consistent treatment of submitted proposals. So far,

95% of proposals submitted via FastLane have been checked by PCV and submitted successfully to NSF in FY 2016. (Note: Special Post Docs, Award Supplements, and PI-Transfers are not included in PCV at this time.)

#### Future Implementation Milestones

- Continue to review internal guidance and procedures, and more aggressively use advanced monitoring and other outreach opportunities for NSF awardees to emphasize the importance of aligning their policies and procedures with the *UG*.
- Consolidate the external-facing *PAPPG* from a two-volume document comprising the *Grant Proposal Guide* and the *Award Administration Guide* into one concise document covering all NSF policies and procedures from pre-award through post-award and closeout.
- Consolidate the internal-facing *PAM* to provide NSF staff links to the *PAPPG* and *OMB Uniform Guidance*, providing access to a single, definitive source for federal policies and procedures.
- Continue to brief the research community and NSF staff on upcoming changes to NSF policy documents via in-person and virtual settings to maximize opportunities for dialogue and clarification, as well as on-demand reference information.
- Continue to expand use of PCV to ensure fair and consistent application of business rules while decreasing administrative burden on researchers, research administrators, and NSF staff.
- Continue multi-year project to upgrade NSF's Awards System, further enhancing the Agency's ability to enforce business rules consistently while streamlining internal processes.

#### **Challenge 3**

Due to OMB Uniform Guidance changes raising the Single Audit threshold from \$500,000 to \$750,000, take additional steps to oversee awardees that fall below the threshold.

#### Progress made in FY 2016

- Rather than diverting resources to address efforts deemed of lower risk to the federal government, continued to use an internal analysis of risk across the NSF portfolio as a basis for focusing advanced monitoring on awardees receiving between \$2 million and \$15 million in NSF funds. Additionally, prior to implementing the *Uniform Guidance*, OMB and the Council on Financial Assistance Reform (COFAR), in which NSF played an instrumental role, assessed that increasing the single-audit threshold by \$250,000 (i.e., additional expenditures from any federal source) still allowed coverage of more than 99 percent of federal dollars awarded to more than 87 percent of federal grant recipients.
- Continued to fully implement the *Uniform Guidance* and to review, as applicable, all records that awardees are required to maintain for review by federal agencies, pass-through entities, and the Government Accounting Office throughout a broad array of pre- and post-award oversight efforts, especially advanced and baseline award monitoring activities.

#### Future Implementation Milestones

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

#### **Challenge 4**

Due to OMB Uniform Guidance changes to documentation requirements for labor effort reporting, reinforce with awardees the need to design and implement controls to reduce the risk of improper charges to awards and to provide a means to ensure the controls are achieving their objective.

Progress made in FY 2016

- Compared *Uniform Guidance* with prior OMB guidance, noting three major changes related to labor effort reporting: (1) removed examples of acceptable methods for charging and documenting labor effort to federal awards; (2) removed “suitable means of verification” language; and (3) emphasized development and adherence to strong internal controls by awardees. While awardees may use budget data to estimate reasonable approximation of the activity actually performed, their systems of internal controls must include processes to review interim, estimated charges. NSF believes the *Uniform Guidance* requirements are essentially identical to those cited under the previous “Planned Confirmation Methodology.”
- Continued efforts to ensure that awardees comply with federal labor effort reporting requirements through feedback mechanisms resulting from oversight activities such as pre-award reviews, audit resolution, baseline and advanced monitoring, and post-award adjustment reviews.

Future Implementation Milestones

- Modify written internal guidance for performance of NSF oversight activities regarding policies and procedures for labor effort charges by award recipients (i.e., update Standing Operating Guidance to fully align with the *Uniform Guidance*).
- Refine, as necessary, and implement FY 2017 baseline award monitoring for the entire grant portfolio.

**Challenge 5**

Due to *Uniform Guidance* changes in the audit resolution process, offset the 30-day shortened timeframe for NSF by establishing a new accelerated process for identifying and tracking reports requiring resolution.

Progress made in FY 2016

- Analyzed 1,799 audit reports resolved between FY 2009 and FY 2016, noting that the large majority of reports were resolved in a timely manner. NSF does not foresee that the *Uniform Guidance* change poses a significant challenge to compliance with timeliness of resolution.
- Augmented Cost Analysis and Audit Resolution (CAAR) staff by two Cost Analysts to mitigate effects of workload in other priority areas, to aid in timely resolution of complex OIG audits.
- Modified the audit resolution module within CAAR’s Monitoring and Tracking Database to track audit reports based on the date of their acceptance by the Federal Audit Clearinghouse (FAC) to set requisite six-month audit resolution target dates.

Future Implementation Milestones

- Accept OIG transfer of responsibility for, and develop procedures for, identifying and tracking single-audit reports submitted to the FAC requiring NSF resolution thus reducing the number of days between FAC acceptance and completed resolution.
- Continue to assess the effects of recent changes in policies/practices that have potential for impacting timeliness of audit resolution, including assumption of FAC drawdown responsibilities, increase of single-audit thresholds to \$750,000 in federal expenditures, risk management, and potential opportunities for process streamlining.

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

Lead: Directorate for Social, Behavioral, and Economic Sciences

### **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.

NSF has taken concrete steps to enhance 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. 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 particular project. NSF's program: 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 committed to heighten the U.S. and international STEM community's awareness of these resources.

### **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 2016

- Continued to support research that provides answers to questions about creating responsible research communities.
- Continued to share state-of-the-art understanding of what approaches are most effective in outreach opportunities with NSF staff, and with U.S. and international scientific research and education communities.
- Identified and developed funding mechanisms to support reproducible and reliable science.
- Funded a major relaunch of the Online Ethics Center (OEC) website in February 2016, representing a significant expansion of resources and site functionality to include all of the sciences NSF supports. OEC is an NSF-funded initiative to serve those who promote learning and advance understanding of responsible research and practice in engineering and science. It provides online resources to engineers,

scientists, faculty, and students to understand and address ethically significant issues that arise in scientific and engineering practice and from the developments of science and engineering.

- Funded the workshop, “Enhancing Robust and Generalizable Experimental Behavioral Science” at Arizona State University. The goal of the workshop is to conduct a systematic analysis of disincentives undermining diversity and incentive structures supporting convenience and inertia over good science practices. An action plan will be developed for addressing and ameliorating these issues through more specific guidance for researchers.
- Hosted an RCR workshop at NSF in April 2016 for NSF program officers and other community members. The workshop highlighted the impact of NSF’s policy on RCR training, along with best practices. Experts from federal agencies, the National Academies of Science, and universities discussed graduate and post-doc training, RCR challenges, RCR strategies, and RCR successes.

#### Future Implementation Milestones

- Continue to support and share research that provides answers to questions about creating responsible research communities, robust and reliable science, and best practices for ethical STEM.
- Outcomes of the Arizona State University workshop will include structured guidance for addressing the well-documented sampling bias that will contribute to broadening the sampling protocols for experimental behavioral science research.
- CCE-STEM program activities include funding a workshop on “Qualitative Research Ethics in the Big-Data”; an institutional transformation grant at the Georgia Institute of Technology titled, “The Role of Service Learning and Community Engagement on the Ethical Development of STEM Students and Campus Culture”; and five grants covering research projects in ethical maturity, ethical practice and responsible conduct of research in STEM.
- Issue an NSF Dear Colleague Letter (DCL) emphasizing the importance of the responsible and ethical conduct of research, and highlighting the availability of NSF-funded tools and resources on which institutions can rely in developing their required RCR plans. The DCL will also showcase NSF-funded research and workshops in this area.