

FY 2012 Top Management Challenges

CHALLENGE: Ensuring Proper Stewardship of ARRA Funds

Overview: The American Recovery and Reinvestment Act (ARRA) provided \$3 billion for the National Science Foundation (NSF) as an investment in research that would produce economic benefits and growth over time. NSF staff worked diligently to obligate over 4000 awards during 2009, and the last of the ARRA funds were obligated by September 2010. NSF awardees have registered a 99.8 percent compliance rate with ARRA reporting requirements.

As of the end of FY 2011, just \$1.38 billion of NSF's ARRA funds have been expended, the lowest spending rate (or "burn rate") among federal agencies. On September 15, 2011 OMB issued a memorandum to the heads of federal agencies urging them to spend remaining Recovery funds, and to recapture discretionary grant funds not spent by the end of FY 2013 "to the fullest extent of the law". There are 638 NSF ARRA awards that will not expire until after FY2013.

Challenge for the Agency: The challenge for the agency is: 1) to assure that ARRA funds are not subject to fraud, waste and abuse, 2) to evaluate its award portfolio and identify and reach out to those awardees that are able to accelerate spending within the next two years, and 3) to monitor ARRA awards to assure that grantees continue to fulfill their reporting responsibilities. As ARRA awardees spend down their funds, NSF program managers and administrative staff must be alert to indications of fraud, waste and abuse and intervene when appropriate. In tough economic times such as these, they should also be sensitive to the *appearance* of impropriety or waste, even if rules are not explicitly broken.

In addition, NSF must make a serious effort to press ARRA award recipients to accelerate their spending in support of the U.S. economy, which was one of the primary purposes of the Recovery Act. ARRA funds were intended to provide an immediate stimulus to the economy, and a significant number of NSF's ARRA awards will not expire until after 2013. The agency should take all actions necessary to ensure that those funds are spent as prudently and quickly as possible. Finally, NSF must continue to promote the timely and accurate reporting of financial information by ARRA recipients. A series of OIG reports issued during March 2011 reviewed the reporting practices of seven ARRA recipients and found that smaller awardees lack a clear understanding of the requirements, and thus pose an increased risk of non-compliance. NSF must continue to inform and monitor ARRA awardees about their obligations under the Act.

OIG's Assessment of the Agency's Progress: The agency has worked cooperatively with OIG to identify potential occurrences of fraud, waste and abuse associated with ARRA funds. Regarding the low spending rate of ARRA recipients, NSF states that it is consistent with the expectations that surround academic research and its pattern of spending. The agency continues to actively monitor recipient reporting and the spending of grantees. It has enforced its burn rate condition requiring recipients to expend ARRA funds within one year, and implemented report review logic to catch under or over reporting of jobs created by ARRA.

CHALLENGE: Improving Grant Administration

Overview: In 2010, NSF funded more than 55,000 active awards involving over 2,100 institutions. In light of the fact that most of those awards are made as grants, it is essential that the Foundation's grants management processes be robust enough to ensure the highest level of accountability and stewardship in its external awards portfolio. In particular, those processes should enable the agency to engage in effective oversight throughout the lifecycle of an award.

Challenge for the Agency: Previous OIG audits of NSF's operations have found that the Foundation needs to improve its oversight of awardees' financial accountability, programmatic performance, and compliance with applicable federal and NSF requirements. NSF's Award Monitoring and Business Assistance Program (AMBAP) was designed to provide advanced monitoring activities to ensure that awardee institutions possess adequate policies, processes, and systems to manage their NSF awards.

In FY 2011, NSF performed 26 of the 30 AMBAP planned site visits. NSF has indicated that it was unable to undertake all planned visits due to staffing constraints. Performing the AMBAP site visits is resource intensive as it requires an experienced grant officer to travel to the institution, spend several days on-site, prepare the report, and follow-up on any corrective actions. As continuing budget restrictions are anticipated, it will be an ongoing challenge for NSF to maintain adequate oversight.

Our December 2009 audit of the process for resolving audit recommendations directed at NSF grantees and for following up to ensure that corrective actions are implemented, made several recommendations for improvement. A robust audit resolution process is critical to ensure that institutions receiving funds from NSF take the necessary corrective action to properly manage those funds.

In addition, it is important for NSF to ensure that awardees are providing sufficient oversight of sub-recipients. Our audits continue to find problems in sub recipient monitoring such as inadequately supported and unallowable costs. We have recommended that NSF expand and improve its sub-award monitoring procedures.

OIG's Assessment of the Agency's Progress: In its progress report on the 2011 management challenges, NSF reported that it had taken several actions to strengthen grants management including modifying the AMBAP risk assess-

ment based on analysis of prior findings, focusing attention on institutions that have the least experience in managing federal funds, and conducting outreach to improve compliance.

In response to our audit of the audit resolution process, OIG and NSF formed a working group which developed a new audit resolution process to create more effective stewardship over federal funds awarded by NSF. A joint NSF/OIG work group, the Stewardship Collaborative, continues to work to monitor and improve the audit resolution process and to jointly address outstanding and emerging issues.

CHALLENGE: Strengthening Contract Administration

Overview: For two consecutive years, the monitoring of cost reimbursement contracts has been cited as a significant deficiency during NSF's annual financial statement audit. Cost reimbursement contracts are inherently risky because the government shares the risk that poor performance on the part of the contractor will result in cost overruns. In FY 2011, NSF obligated \$447 million for all contracts. Of that amount, \$315 million were for cost reimbursement contracts, including \$232 million in advance payments issued before work was done.

The FY 2010 financial statement audit report presented seven recommendations for strengthening NSF's contract monitoring practices, cautioning the agency that more attention must be paid to the basic tools of the trade such as incurred cost audits, cost disclosure statements, and cost submissions that are used to check the contractor's compliance with contract terms and federal regulations. Contracting weaknesses have come to light as the agency prepares to award its largest contract, which will provide logistical support to the U.S. Antarctic Program over the course of a decade. Following several delays in the procurement process, the award is expected to be completed by mid-November 2011.

Challenge for the Agency: NSF's challenge is to correct the deficiencies in contract administration that have been identified by NSF's financial statement audit, and to continue to improve the effectiveness of its policies, practices and contracting professionals. The agency is still in the process of obtaining audits of millions of dollars in costs incurred from 2005 – 2010 by the current USAP contractor, a process that was delayed because the USAP contractor did not have an approved cost disclosure statement. There is no assurance that the agency does not overpay for these services without incurred cost audits and approved cost disclosure statements. As a matter of policy, NSF should obtain disclosure statements and incurred cost audits of its largest contracts on a regular basis and promptly resolve any questioned costs that arise.

Corrective actions aimed at strengthening the weaknesses cited by the financial auditors should be implemented as soon as possible. Much can be accomplished without additional resources, but NSF has requested 11 additional

staff in its past two budget requests to form an acquisition support team for contracts. In light of the current budget environment, NSF should consider other alternatives besides adding staff in order to address this challenge.

OIG's Assessment of the Agency's Progress: NSF has made progress toward improving its administration of contracts. The agency now requires its contract specialists to ensure that vendors have disclosure statements prior to making awards. In addition, over the past year NSF successfully resolved questioned costs related to the USAP contractor and recovered \$10.8 million. It has also fully funded DCAA's costs to complete the 2005 thru 2010 incurred cost audits associated with the contract. However, the audits are still in progress, and it is uncertain as to when they will be concluded.

CHALLENGE: Implementing Improvements in Workforce Management and the Workplace Environment

Overview: World-class executive leadership and effective human capital management are essential to NSF's success as a high-performing organization. Thus, the agency's executives must demonstrate outstanding administrative and leadership skills as well as possess exceptional scientific knowledge and expertise for the agency to achieve its fullest potential. To strengthen NSF's ties with the research community and provide the agency with talent, resources, and cutting-edge research and scientific expertise, NSF relies on a variety of non-permanent staff. In 2010, approximately 26 percent of all NSF employees were in some type of non-permanent status, and 20 of the agency's 75 executive level staff came to NSF from academic and non-profit institutions pursuant to the Intergovernmental Personnel Act (IPA). IPAs generally have not worked in the federal government and therefore, are often not familiar with government rules and administrative processes in the federal workplace.

Challenge for the Agency. The Office of Personnel Management, Congress, and the OIG, as well as NSF management and staff, have expressed concerns about workforce management and the workplace environment at NSF. Addressing workforce and workplace challenges requires sustained management attention and commitment from the Director. NSF's response to these concerns generally has been to assemble working groups of NSF staff to assess the issues and recommend corrective action. These groups have given thorough attention to these issues and made more than 100 recommendations for change. However, NSF does not have an effective, structured process for implementing the workforce management changes called for in these recommendations. The workforce management change process also suffers because it lacks a permanent champion with both the time and authority to lead in this area.

The fact that senior leadership positions including the Director for the Office of Information and Resource Management, the Chief Human Capital Officer, and the Director for Human Resource Management were filled for much of 2011 with individuals serving in a temporary or interim status presents an additional challenge to implementation of workforce management improvements.

NSF also faces ongoing challenges in effectively preparing and integrating its rotating executives into the federal government workplace. The temporary nature of NSF's rotator model creates additional challenges to ensure that new executives have the full set of skills (scientific, administrative, and leadership) necessary to lead the agency.

OIG's Assessment of Agency Progress: NSF has taken several steps to address workforce management and workplace environment challenges. For example, NSF now includes IPAs in the performance management system and plans to issue performance appraisals for IPAs in executive level positions in fall 2011. The agency has promulgated a mandatory management training policy for new managers and executives and has developed and actively promotes new leadership and management training programs. NSF also reported that it has addressed 38 recommendations for workforce improvement and that work on an additional 10 recommendations is underway. Despite this progress, critical human resource leadership positions remain filled with individuals acting in a temporary or interim capacity. Finally, permanent leadership for these critical positions should be a high priority for the agency.

CHALLENGE: Encouraging Ethical Conduct of Research

Overview: In 2007, Congress passed the America COMPETES Act to invest in innovation through research and development, and to improve the competitiveness of the United States. Among other things, the Act mandates new proposal requirements for NSF, such as mentoring plans for all postdoctoral positions, and plans to provide training on the responsible conduct of research to undergraduates, graduate students, and postdoctoral researchers. Information gleaned from site visits and through investigations suggests that many institutions are not taking these requirements seriously, thereby placing NSF funds at risk. Integrity is the keystone of the scientific process and product. Without it, precious research funds are wasted both by unprincipled researchers as well as by those researchers whose time, effort, and funds are wasted when they try to replicate the work of their unprincipled colleagues. NSF is challenged to provide more oversight on institution implementation of these requirements and to provide meaningful guidance regarding Responsible Conduct of Research (RCR) training.

Challenge for the Agency: NSF's primary challenge is to ensure that award-ees implement credible RCR programs, thereby creating a top-down culture of academic integrity that extends to all levels of the university. Affirmative steps are necessary to counter the trends of increasing integrity violations. Recent surveys suggest that 75% of high school students and 50% of college students admit to cheating, and 30% of researchers admit to questionable research practices. The science and engineering workforce is an increasing percentage of the overall workforce, but only 10% hold PhD's. The NSF Act places responsibility on NSF to "strengthen scientific [and engineering] research potential at all levels in... various fields." NSF's research and training programs reach individuals who ultimately are employed by academia, industry, and

government. Its broad effect on the US science, engineering and education workforce means that NSF must act to ensure clear understanding of research tenets for all those receiving the benefits of its funds.

Our investigations are consistent with the survey results mentioned above. OIG has seen a dramatic increase in the substantive allegations of plagiarism and data fabrication, especially as it relates to junior faculty members and graduate students. Over the past 10 years, the number of allegations received by our office has more than tripled, as has the number of findings of research misconduct NSF has made based on OIG investigation reports. Although NSF's response to our research misconduct investigation reports is commendably strong, those actions only address incidents after the fact. Extrapolating the number of allegations OIG has received across the 45,000 proposals NSF receives annually, suggests 1300 proposals could contain plagiarism and 450-900 proposals could contain problematic data. Given that NSF funds research in virtually every non-medical research discipline, it is in a unique position to lead the government response to addressing these disturbing trends at all levels of education.

OIG's Assessment of the Agency's Progress: The agency responded to the America COMPETES Act by instituting a requirement that grantees submit mentoring plans for all NSF-supported postdocs and have an RCR training plan for NSF-funded students. The NSF guidance was very limited and offered great flexibility to grantee institutions to develop plans tailored to their needs. OIG has seen grantee RCR programs ranging from high quality mentoring programs to those that simply refer students to web-based or computer-based training. In one instance, a large institution was proud to have trained the two students who were strictly required by NSF policy to be trained (this was an institution of more than 50,000 students). Early intervention is critical to ensuring that students understand proper professional practices and the implications of misconduct. Based on what we have seen, NSF should expand its influence in this arena.

Research is also an increasingly global enterprise. Addressing integrity issues and training in domestic efforts is not sufficient to ensure the integrity of NSF funded activities. OIG's review of the Basic Research to Enable Agricultural Development (BREAD) program proposals and awards highlighted a significant failure of the US PIs to collaboratively develop oversight programs with foreign subawardees. The absence of such collaboration resulted in the submission of proposals and the awarding of grants that contained plans applicable to only domestic awards. The most poorly developed aspect of these plans was in the responsible conduct of research training and research misconduct reporting. Based on our report NSF took two actions. The agency modified its subsequent solicitation to include more details about the expectations for oversight plans; and it encouraged the development of comprehensive oversight plans in collaboration with the international subawardees. Unfortunately, our recent review of annual reports demonstrates little significant improvement in the oversight plans, a result that is distressing. In considering how it will effectively address this challenge NSF should ensure that annual reports and future proposals comprehensively address oversight plans.

CHALLENGE: Effectively Managing Large Facilities and Instruments

Overview: Due to their inherent financial and operational risks, managing the design, construction and operation of NSF's large science infrastructure projects has appeared on OIG's list of management challenges for the past decade. When the agency decides to construct a telescope, earthquake simulator, or other scientific tool, it generally enters into a cooperative agreement with an institution to design, build and manage the facility. NSF received \$117 million for its Major Research Equipment and Facilities Construction account for FY 2011 and \$400 million in Recovery Act funds in FY 2009 for the construction of three major facilities that are currently under development. The agency has made steady progress towards improving its project management capability since 2003, when NSF first appointed a Deputy Director for Large Facilities. However, according to three recent audits conducted by DCAA for the OIG, costs for contingency provisions contained in each of the contracts are unallowable.

Challenge for the Agency: NSF needs to ensure that the process it is using for developing, managing, and accounting for contingency funds is sound. In September 2011, OIG issued an audit report of a proposal to build the National Ecological Observatory Network. It found that the bid included \$76 million in unallowable contingency costs. Earlier in 2011, an audit of the proposal to build the Advanced Technology Solar Telescope questioned 21 percent of the cost, or \$62 million, that was reserved for contingencies. The two audits questioned those costs on the basis that setting aside contingent funds for events that lack a certain level of specificity is unallowable.

The same issue also arose in connection with a 2010 audit of the proposed budget for the Ocean Observatories Initiative which included \$88 million for contingencies. Auditors recommended the removal of the unallowable contingency provisions from the proposed budgets, and advised NSF to implement policies that require the agency *rather* than the awardee to control the contingency funds until a need for them is demonstrated. Without adequate controls on the establishment and utilization of contingencies, the agency cannot be certain that funds are not being used to hide poor project planning, management or other deficiencies in administration.

OIG's Assessment of the Agency's Progress: During the past year, the agency has participated in ongoing discussions with OIG regarding the resolution of audit findings and recommendations related to contingencies. Once agreement is reached, NSF has indicated that it will update the Contingency Policy and Procedures module of its Large Facilities Manual. In addition, the agency states that it has engaged in a number of activities to strengthen its oversight policies related to large facilities, including several business system reviews of large infrastructure projects such as Cornell High Energy Synchrotron Source (CHESS) and Network for Earthquake Engineering Simulation (NEES).

CHALLENGE: Managing Programs and Resources in Times of Budget Austerity

Overview: Taxpayers expect government managers to be prudent custodians of agency funds in both good times and bad, but expectations are even higher when federal deficits are large and budgets are tight. In tough economic times Federal agencies and programs must make every dollar count or risk losing the public's confidence. Responsible managers should re-evaluate their operational activities in light of the current economic conditions and determine where and how money might be saved. While government budgets are developed long in advance, there are numerous discretionary expenditures in every organization that occur on a weekly or monthly basis and present real opportunities for savings.

Recently OIG has performed several reviews to examine expenditures such as these and identify possible cost savings, as well as changes that might be made to the way goods and services are purchased that could lead to efficiencies and reduced opportunities for fraud waste and abuse. For example, NSF spends \$500,000 per year to provide light refreshments to peer review panelists, when a per diem payment for food is already included as part of their compensation. The report recommended that NSF reconsider these expenditures and if it decided to continue them, then centralize the purchasing process as a safeguard against excessive charges and potential fraud. In another review, OIG assessed NSF's purchases of wireless devices and services, which in FY 2010 amounted to \$660,000. Like the earlier review, the report cited the need for a centralized procurement process which could result in economies of scale when purchasing, and concluded that the agency should establish a policy to guide the purchase, distribution and use of wireless technology.

Challenge for the Agency: There are many opportunities to conserve money within a \$7 billion dollar organization like NSF without impinging on the agency's core mission. The agency is therefore challenged to identify opportunities to streamline processes and cut costs where it can in order to send a clear message to its employees and stakeholders that strong, sound management practices are being applied; reasonable ideas to reduce spending are welcome and will be acted on; and at a time of hardship for so many, the public's continued financial support for science is not taken for granted.

OIG's Assessment of the Agency's Progress: The NSF Director demonstrated support for efforts to curb wasteful spending at a recent all-hands meeting when he asked staff for their ideas to save the agency money. However, NSF should follow up on his statement with a more aggressive outreach initiative to enlist as much participation as possible. The agency responded to the report on refreshment purchases by setting a cost ceiling of \$25 per day for each recipient a promise to exercise more oversight over the program, and a commitment to analyze the costs and benefits of centralized purchasing. NSF also agreed to develop a policy regarding wireless devices and services, and to analyze the costs and benefits of a centralized purchasing process before deciding whether or not to adopt the recommendation.

We have also identified two emerging challenges that warrant NSF's close attention—transitioning to cloud computing and to the trusted internet connection and planning for the next NSF headquarters.

Transitioning to Cloud Computing and to the Trusted Internet Connection

Cloud computing enables agencies to achieve efficiencies by utilizing shared computing resources, such as servers, networks, storage, applications, and services. The Federal Cloud Computing Strategy and the Cloud First Policy state that Federal agencies are to consider safe, secure computing options before making any new information technology investments.

In September 2011, NSF reported that it has established pilots to evaluate email and instant messaging operations in a private cloud environment. As NSF considers plans to transition information, applications, or data to the cloud, it needs to ensure that security and internal control considerations are addressed, and that cloud computing contracts provide adequate access to information, and appropriate application maintenance for the protection of data and intellectual property.

Regarding the Trusted Internet Connection, pursuant to OMB direction, agencies are required to reduce and consolidate the number of external access points, including Internet connections, and ensure those connections are routed through an OMB-approved Trusted Internet Connection. NSF has migrated its internet connections to a Trusted Internet Connection provider. NSF retains primary responsibility for information technology security and should continue to coordinate its security requirements with the Trusted Internet Connection provider to ensure it utilizes strong information technology safeguards. It is critical that NSF review and understand the risks and costs of cloud technology as it considers moving data to the cloud. The OIG will be closely following NSF's progress in this endeavor.

Planning for the Next NSF Headquarters

NSF's leases for headquarters facilities in Arlington, Virginia expire in December 2013. It appears that NSF is meeting the planning milestones that are the necessary prerequisites for Congressional action. In its FY 2012 budget submission, NSF requested that funds for its relocation remain available until expended to allow it flexibility for planning and executing the most cost effective acquisition strategies. The report accompanying the Senate Commerce, Justice, Science FY 2012 appropriations bill directed NSF to find savings from future headquarters planning.

Planning for a new headquarters building during a time of budget austerity presents a challenge for NSF. As the lease expiration approaches, the OIG will pay close attention to NSF's activities in this area.

About the Cover...

Original artwork, acrylic on canvas, entitled "The Grizzly Bear" painted by OIG investigative scientist, Scott Moore.

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