



National Science Foundation • Office of Inspector General
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MEMORANDUM

DATE: August 24, 2012

TO: Dr. Cora B. Marrett
Deputy Director, National Science Foundation

FROM: Dr. Brett M. Baker /s/
Assistant Inspector General for Audit

SUBJECT: *American Recovery and Reinvestment Act Lessons Learned
Review, Report No. 12-3-002*

Attached please find the final report of our review of NSF and OIG lessons learned from the implementation of the American Recovery and Reinvestment Act. We are not requesting a corrective action plan as the report contains no recommendations. We have included NSF's response to the draft report as an appendix to the final report.

We appreciate the courtesies and assistance provided by NSF staff during the review. If you have any questions, please contact Marie Maguire, Senior Audit Manager, at (703) 292-5009.

Attachment

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**American Recovery and Reinvestment Act
Lessons Learned Review**

**National Science Foundation
Office of Inspector General**

August 24, 2012

OIG 12-3-002



BACKGROUND

The American Recovery and Reinvestment Act of 2009 (ARRA) provided funding for job preservation and creation, infrastructure investment, investments needed to increase economic efficiency by spurring technological advances in science and health, and fiscal stabilization of State and local government budgets. The National Science Foundation (NSF) was appropriated \$3 billion of ARRA funds and the NSF Office of Inspector General (OIG) was appropriated \$2 million of ARRA funds.

Over three years after ARRA, it is important for Federal agencies to identify and assess which processes and mechanisms were effective or posed challenges in implementing and administering ARRA programs. Learning what worked and what did not can help provide an accurate portrayal of any best practices and opportunities for improving transparency and accountability of Federal funds. Both the NSF and the NSF OIG assessed the new practices implemented as a result of ARRA and will continue to utilize some of these practices.

RESULTS OF WORK

The NSF's approach to meeting its requirements for ARRA included funding highly-rated proposals that were previously declined due to lack of available funding. This was one of the tools that led to NSF awarding most of its ARRA funds by September 30, 2009. In addition, according to NSF's Office of Budget, Finance, and Award Management (BFA) staff, increased monitoring and oversight of ARRA awards, agency cross collaboration, and outreach to the scientific community led to a high rate of awardee compliance with recipient reporting requirements, program staff's increased awareness of stewardship, and improved relations between the OIG and NSF. However, according to BFA staff, NSF does not have the staff resources needed to sustain the level of additional oversight NSF provided during ARRA implementation. Nevertheless, NSF plans to continue with some of the new ways of doing business started or learned during ARRA implementation, including utilizing workplace flexibilities, monitoring of expenditure rates, developing interim performance measures, and improving data quality.

The OIG, like NSF, also utilized new techniques to meet its ARRA requirements, including implementing new audit techniques, increased collaboration with both NSF and the Inspectors General (IG) community, and additional outreach to the scientific community. These new techniques resulted in more efficient and effective audits, more timely suggestions for NSF, and enhanced working relationships with the NSF, scientific, and IG communities. The OIG plans to continue with these new approaches and will continue using the Recovery Accountability and Transparency Board's (RATB) Recovery Operations Center (ROC).

NSF's INNOVATIVE APPROACH

NSF's approach to implementing ARRA included funding highly-rated proposals that were previously declined due to lack of available funding. By utilizing the pool of existing highly rated proposals rather than relying primarily on ARRA-specific solicitations, NSF could make

the awards expeditiously and was able to obligate most of the ARRA funds by September 30, 2009. However, this strategy was challenging for NSF to implement because it required the agency to maintain good communication across business and program offices in order to 1) develop workable policies and business processes, 2) confirm with potential recipients that the proposed work and institution were still a viable grantee and had not received funding elsewhere, and 3) confirm that funding the proposal would further ARRA priorities. Although NSF found the strategy to be successful, staff informed us that they do not expect to routinely use this process except under circumstances where a significant increase in appropriations is made available late in a fiscal year.

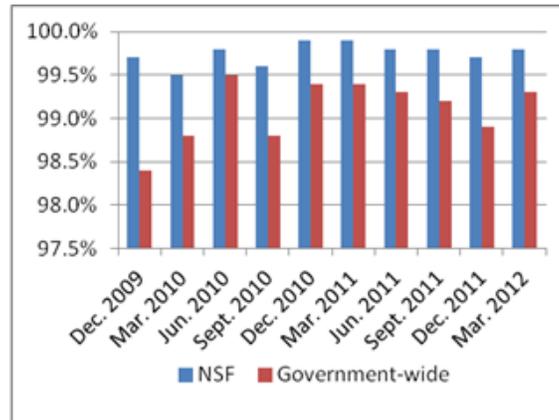
NSF's approach also included increased monitoring and oversight of ARRA awards. For example, NSF and NSF contractors conducted data quality reviews of ARRA recipients' quarterly reports using automated data quality checks and other manual checks. NSF established and included additional terms and conditions in ARRA awards to ensure compliance with ARRA legislation and NSF's new ARRA policies and procedures. Beginning with its Fiscal Year 2010 risk assessment, NSF began to assign risk points for ARRA funded awards to ensure that the risks associated with the unique accountability and transparency requirements of ARRA were appropriately included as factors for selecting recipients to receive a site visit review. In addition, NSF enhanced its desk reviews and site visits of ARRA awards by adding an ARRA review module. Finally, NSF closely monitored recipients' submission of the required quarterly reports which outline financial and programmatic outcomes of ARRA awards. NSF sent emails to those recipients that did not submit their reports, informing them that NSF reported the awardee organization to the RATB and warning the awardee that failure to report for a second quarter would result in NSF suspending the award. These emails also warned that failure to report could result in NSF terminating an ARRA award. NSF suspended eight ARRA awards for not submitting the required reports for two quarters and terminated one ARRA award for not reporting for three quarters.

NSF also used agency cross-collaboration to implement ARRA. For example, NSF established four working groups in the areas of budget, pre-award, post-award, and recipient reporting for coordinating the broad range of ARRA issues. NSF program and financial staff and OIG staff were included on these working groups. NSF also created an ARRA Steering Committee comprised of NSF and OIG senior management. NSF management on the ARRA Steering Committee was responsible for achieving NSF's ARRA goals and the OIG senior management participated on the Committee in an advisory capacity.

Finally, NSF conducted extensive outreach on ARRA requirements with the scientific community. NSF staff communicated with awardee institutions on a regular basis on ARRA reporting requirements and increased oversight activities. NSF developed guidance for its ARRA award recipients on several topics including recipient reporting, tracking of ARRA funds, and spending rate. NSF communicated its guidance to recipients through several different means including webcasts, NSF's ARRA website, meetings and conferences, inclusion in ARRA awards' terms and conditions, and many phone calls and emails.

BENEFITS OF NSF'S NEW APPROACH

According to NSF management, the additional NSF oversight and outreach for ARRA led to a high rate of compliance with recipient reporting requirements. NSF has one of the highest awardee recipient reporting compliance rates in the government as shown in the chart below:



Source: NSF

According to BFA staff, NSF's workgroups' integrated approach resulted in program staff having a greater appreciation for stewardship, and the opportunity for partnership with NSF business and award management staff. Furthermore, the interaction on workgroups between the OIG and NSF officials has strengthened the OIG and NSF working relationships.

NSF PRACTICES CONTINUING AFTER ARRA IMPLEMENTATION

According to NSF management, it cannot sustain the additional oversight and monitoring implemented to comply with ARRA. NSF used its existing resources, including contract support, to assist with the additional oversight of its ARRA awards, which reduced the staff and resources available to oversee awards for existing programs and resulted in NSF staff working overtime to implement ARRA. However, NSF has identified the following practices that it will either continue or do differently in the future.¹

First, NSF monitored expenditure rates, including monitoring expenditures to ensure ARRA awardees expended funds within 12 months of the award date. NSF's BFA has already begun initial steps toward developing business processes and tools that would help agency business and program staff to monitor awardee expenditures and spending rates for all NSF awards.

Second, NSF staff also increased its knowledge of NSF systems and data as NSF put in place an extensive data quality plan to review recipient quarterly reporting data. According to NSF staff, NSF is implementing some system edits related to Central Contractor Registration (CCR) verification and zip codes to strengthen NSF's award data. NSF staff anticipates applying its

¹ Many of the new NSF practices identified in this report came from NSF's response to the OMB *ARRA New Ways Questionnaire*.

increased systems knowledge and lessons related to CCR verification in its planning for its financial system modernization.

Third, although staffing levels could not be sustained on all ARRA workgroups, NSF has indicated that it will continue to employ a risk-based approach targeting the most complex awards and issues that need a similar approach.

Fourth, NSF will employ new strategies to continuously improve outreach, and expand the opportunities for all staff to enhance and sustain NSF's culture of communication with award recipients. For example, NSF used virtual technology, such as webcasts during ARRA, and staff has stated that they will continue to use this technology.

Fifth, to deal with the increased workload during ARRA, NSF extended workplace flexibilities, such as allowing telework on the weekends and earlier work start times. NSF recently implemented a new policy allowing staff to start work at an earlier time and is considering other flexibilities as NSF expands its telework program.

Finally, NSF learned that for multi-year awards, it should define final and interim goals and targets at the outset of a program. Specifically, NSF established goals for the Education and Human Resources (EHR) programs' total participation by the end of the ARRA awards (Fiscal Years 2012 or 2013), but did not set targets for each interim year, so NSF could not determine on an annual basis if progress being made was appropriate. To correct this situation, NSF specified interim targets in the program plans in May 2010, after the awards were made. However, according to an NSF official, setting acceptable and measurable goals after the awards were made created an added burden for the awardees.

OIG's INNOVATIVE APPROACH

The OIG, like NSF, also utilized new techniques to meet its responsibilities under ARRA, including implementing new audit techniques, increased collaboration with both NSF and the IG community, and additional outreach to the scientific community.

The OIG's approach included implementing several new and innovative oversight mechanisms including using data analytics and conducting proactive reviews. First, the Office of Audit (OA) began in 2010 to use data mining and data analytics to identify high risk awardees during audit planning and to conduct its audits. OA selected awardees to audit based on the results of comparing data from several sources, reviewing that data for anomalies and discrepancies, and ranking award recipients for risk based on the results of these reviews and comparisons. NSF OIG considered ARRA as a risk factor when selecting awardees to audit. After OA selected which awardees to audit, OA used data analytics to identify areas of high risk and to target the OA resources to specific areas which the data indicates as potential for waste and abuse. OA is currently using data analytics on two of its ongoing audits of universities which received NSF ARRA funding. The OIG also relied on the RATB's Recovery Operation Center's (ROC) use of data analytics during ARRA. The NSF OIG, for example, received information from the ROC that an institution on the government's suspension and debarment list received an NSF ARRA award.

Second, OA conducted real-time reviews of NSF's and awardees' ARRA policies and procedures, systems, and capabilities to separately account for ARRA funds. The OIG conducted these proactive reviews to provide timely feedback to NSF and awardees to help mitigate risk and prevent problems from occurring. These proactive reviews resulted in quick turnaround alert memoranda and included suggestions for improvements in areas such as recipient reporting, NSF ARRA program plans, and other NSF ARRA policies and procedures. The Office of Investigations (OI) also conducted a proactive investigative review to identify plagiarism in ARRA award proposals. OI found no significant plagiarism in the ARRA proposals reviewed.

The OIG also increased collaboration with both NSF and the IG community. First, the OIG was included, at NSF management's invitation, in several NSF working groups created to determine how to implement ARRA requirements, allowing the OIG to raise issues for NSF's consideration early in the process. The OIG's role on these teams was to provide technical advice based on past experience and from an independent viewpoint. In addition, OIG senior management participated in an advisory capacity on the NSF ARRA Steering Committee, which was responsible for achieving NSF's ARRA goals. Second, the NSF OIG regularly collaborated with a group of 29 OIGs, meeting regularly to discuss ARRA-related audit activities and to coordinate efforts for ARRA oversight. Issues discussed included various topics such as ARRA reporting requirements.

Finally, the OIG increased its outreach with the scientific community, including developing an OIG ARRA website and presenting at various awardee conferences. The ARRA website included audit and investigation activities, links to the NSF OIG ARRA work plans, and NSF OIG monthly reports to the RATB.

BENEFITS OF OIG'S NEW APPROACH

The use of data mining and data analytics to both plan and to conduct audits of ARRA recipients enabled the OIG to work more efficiently and effectively. Using data mining during the audit planning process helps to ensure that the OA is spending its resources conducting audits of those recipients that pose the highest risk to the Federal government. Using data analytics during audits allows the OIG to review all of an awardee's transactions, whereas before only a small sample of transactions were reviewed.

In addition, the NSF OIG's proactive reviews and inclusion on both the NSF ARRA working groups and Steering Committee were effective as the NSF OIG was able to communicate issues in a more timely fashion, enabling NSF management to make real-time improvements. For example, as a result of one of these real-time reviews, NSF implemented additional oversight for ARRA recipients that the OIG considered to be high-risk. The NSF OIG's proactive review phase also led to better relations and more frequent collaboration and communication between the OIG and NSF. This real-time collaboration was a new experience for both the OIG and NSF and has resulted in a better-informed and more cooperative working relationship that benefits both organizations. Similarly, NSF OIG collaboration with the OIG community allowed OIGs to share information on potential problem areas with other OIGs.

OIG PRACTICES CONTINUING AFTER ARRA IMPLEMENTATION

The NSF OIG will continue to incorporate data analytics into both its future audits and to identifying waste, fraud, and abuse. In addition, the OIG will continue to collaborate with the scientific and OIG community. For example, the NSF OIG is coordinating efforts with the RATB's ROC to use data analytics to analyze Small Business Innovative Research awards now that the ROC has the authority to work on non-ARRA awards. The NSF Inspector General will also continue to participate on the Government Accountability and Transparency Board whose mission is to "identify implementation guidelines for integrating systems that support the collection and display of Government spending data, ensuring the reliability of those data, and broadening the deployment of fraud detection technologies, including those proven successful during the implementation of the Recovery Act."

Prior to ARRA, the NSF OIG conducted an outreach program for grantees to help meet the OIG's mission to prevent fraud, waste, and abuse. The OIG will continue to conduct this type of outreach as well as continue outreach and training events with the IG community.

The NSF OIG also learned that in the future the OIG should promote its website more. The NSF OIG ARRA website, <http://www.nsf.gov/oig/recovery.jsp>, and resources on this website were not viewed by many people. Between February 1, 2009 and April 1, 2012, the NSF OIG ARRA website received 101 external hits from outside of NSF. Similarly, the OIG ARRA training site received 30 external hits, the ARRA audit activities received 26 external hits, and the ARRA investigation activities received 16 external hits.

CONCLUSION

Both the NSF and OIG plan to utilize the best practices and lessons learned during ARRA implementation to improve the efficiency and effectiveness of their organizations. The goal is that the relationships built during ARRA implementation between NSF and the OIG and within the OIG community will continue to grow and foster new best practices and improving government-wide efforts for transparency and accountability of Federal funds.

SUMMARY OF AGENCY RESPONSE AND OIG COMMENTS

NSF agreed with the report.

APPENDIX A: AGENCY'S RESPONSE

NATIONAL SCIENCE FOUNDATION
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August 22, 2012



OFFICE OF THE
DEPUTY DIRECTOR

MEMORANDUM

TO: Ms. Allison C. Lerner
Inspector General

FROM: Dr. Cora B. Marrett *Cora B. Marrett*
Deputy Director

SUBJECT: NSF response to the OIG draft report American Recovery and Reinvestment Act
Lessons Learned Review

Below is the Foundation's response to the OIG draft report American Recovery and Reinvestment Act Lessons Learned Review. This response was developed in close consultation with BFA. Please let me know if you have any questions.

NSF Response:

National Science Foundation (NSF) appreciates the collaborative approach the Office of the Inspector General (OIG) took in preparing this analysis. Through the combined efforts of NSF management staff and OIG staff, the resulting report presents an accurate picture of the myriad steps that were taken to help ensure the objectives of American Recovery and Reinvestment Act of 2009 were met through NSF's investment strategies and aggressive award monitoring and oversight. NSF looks forward to strengthening this collaborative approach as the oversight of ARRA awards continues and as we look to capture as best practices many of the procedures and tools described in this report.

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APPENDIX B: OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of this review is to identify which actions, processes, and mechanisms have been either beneficial or posed challenges to NSF and the NSF OIG in meeting the requirements of ARRA. This report includes NSF's perspective of the monitoring, oversight, and transparency efforts performed by NSF and NSF OIG and the OIG's self-assessment of how it monitored ARRA implementation at NSF.

To accomplish our objective, we interviewed officials in NSF's Office of Budget, Finance, and Award Management (BFA) and reviewed BFA personnel's written responses to the template questions which covered NSF-wide ARRA activities. We also reviewed written responses from program directors from nine programs which received ARRA funds. To verify the validity of NSF's responses, we reviewed the NSF ARRA websites, ARRA program plans, Steering Committee notes, and ARRA data quality plans. We also reviewed and considered the responses NSF submitted to the Office of Management and Budget (OMB) in 2010 for OMB's *ARRA New Ways Questionnaire* of Federal agencies' implementation of ARRA.

We also interviewed OIG staff involved with the oversight and monitoring of NSF's ARRA activities, including senior managers and staff performing audits and investigations. In addition, we reviewed information from previously issued OIG reports and memoranda, OIG monthly ARRA activity reports to the RATB, notes from NSF and OIG ARRA meetings, OIG ARRA outreach presentations, and other documents to support the OIG's oversight and outreach efforts.

We conducted this review between March 2012 and August 2012 in accordance with the January 2012 Quality Standards for Inspection and Evaluation, issued by the Council of the Inspectors General on Integrity and Efficiency. We also assessed our own ARRA efforts and as such this part of the report is informational in nature.

We also reported the results of this review to the Department of Interior (DOI) OIG, which is coordinating a joint RATB/Inspector General initiative to document the lessons learned from the implementation of ARRA. The DOI OIG prepared a standard template of questions for all of the 16 participating OIGs to use and will prepare a separate report summarizing the responses from all the participants, including NSF OIG.