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Office of the Inspector General

ALERT MEMORANDUM

DATE: May 6, 2010

TO: Timothy Killeen
Assistant Director, Directorate for Geosciences

Martha Rubenstein
Acting Director, Office of Budget, Finance, and Award Management

FROM: James J. Noeth /s/
Acting Associate Inspector General for Audit

SUBJECT: *Survey of NSF's Oversight of the Alaska Region Research Vessel Construction Project #10-6-006*

In keeping with our efforts to focus on the prevention of fraud, waste, and abuse in American Recovery and Reinvestment Act of 2009 (Recovery Act) programs and funding, we are continuing to conduct “real-time” reviews of the National Science Foundation’s (NSF) Recovery Act activities. As such, we have been reviewing NSF activities while they are developed and implemented to provide NSF with more timely and constructive feedback on issues as they arise. NSF’s largest Recovery Act award to date funds the construction of the Alaska Region Research Vessel (ARRV) and in light of the size and complexity of this project, our office initiated a preliminary review of NSF’s processes for overseeing the construction of this vessel.

Background

The Recovery Act allocates additional funding of \$3 billion to NSF, \$400 million of which was allocated to the Major Research Equipment and Facilities Construction account. Of these funds, NSF awarded \$148 million to the University of Alaska Fairbanks (UAF) for the construction of the ARRV, which has been in NSF planning stages since 2000. These Recovery Act funds are to be spent directly on the construction of the vessel at a U.S. shipyard. On December 8, 2009, UAF announced the award of the construction contract to Marinette Marine Corporation in Marinette, Wisconsin.

When completed, the ARRV will be a 254 foot research vessel named *R/V Sikuliaq* and will have its homeport in Seward, Alaska. The ARRV is designed to enable science endeavors in the ice-choked waters around Alaska and the polar region using its capability to break up to 2.5 feet of first-year ice. The ship will contain extensive research instrumentation and flexible winches to

raise and lower scientific equipment, as well as on-board laboratories. Once constructed and tested, the ship will be made available to scientists and students in a variety of disciplines through the University-National Oceanographic Laboratory System (UNOLS) scheduling process.

Given the significant funds planned to construct this new vessel and high visibility of the Recovery Act awards, NSF needs to closely monitor UAF's oversight of the ARRV construction. To accomplish this, NSF has put oversight structures in place for monitoring the ARRV project.

Survey Objective, Scope and Methodology

The objective of our survey was to develop an understanding of NSF's processes for overseeing the ARRV construction project and for managing the associated risks of ensuring the project is on time, on budget, and meeting performance expectations. In order to gain an understanding of NSF's oversight of the construction of the ARRV, we reviewed:

- NSF's policies, procedures, and guidance related to large facilities and Recovery Act requirements;
- The Office of Management and Budget's guidance addressing Recovery Act requirements;
- All award agreements, proposals, solicitations, and panel reviews for the ARRV project;
- Major subcontracts awarded by the UAF for ARRV;
- NSF's Internal Management Plan for managing the ARRV project;
- UAFs' Project Execution Plan detailing UAF's process for managing the project;
- Correspondence, diary notes, and project reports available in the award files on eJacket, the NSF document control system;
- Relevant internal control guidance and prior audit reports issued by the General Accounting Office;
- Prior audit reports issued by the OIG and other Federal agencies;
- Literature, books, and other publications detailing project management best practices and lessons learned relating to project management risks and mitigation strategies; and
- Other relevant scholarship on internal control guidance.

In order to understand the risks and challenges of constructing the ARRV, we interviewed key NSF staff involved with the ARRV project, including the program director and the grants and agreements official responsible for the ARRV award, as well as the Deputy Director of the Large Facilities Office. Using the knowledge we gained through these interviews and document reviews, we identified the key individuals and groups involved in the ARRV project and their primary roles at both NSF and UAF. However, given our focus on NSF's oversight, we did not interview officials at UAF or evaluate its organizational structure and plans for managing the ARRV project.

This survey focused on NSF's oversight of the construction of the ARRV. We did not, however, conduct any analysis of the anticipated project costs. For example, we did not conduct a pre-award audit of the shipyard chosen to build the vessel. Further, while this survey work was conducted under Government Auditing Standards, we have not performed any testing of

processes to evaluate their effectiveness or verified all management assertions. We are issuing this memorandum at this time to proactively inform NSF management of our preliminary thoughts and conclusions and our plans for future reviews of the ARR V project.

NSF's Oversight Structure

Scholarship on establishing internal control emphasizes that the core of any business or operation is its people. According to the Government Accountability Office's *Standards for Internal Control in the Federal Government*, organizational structure and a commitment to competence are key components of a positive control environment, which in turn is the foundation for establishing strong internal control. In particular, the organizational structure provides the framework for planning, directing, and controlling operations to achieve objectives, and a commitment to competence helps to ensure that team members have the appropriate knowledge, skills, and training to accomplish their job duties.

According to other scholarship on internal control,¹ monitoring can be done in two ways, either through ongoing activities or separate, periodic evaluations. Ongoing monitoring is built into the organization's normal, recurring operations, and is done on a real-time basis. For example, frequent telephone conferences can focus on identifying and resolving award issues as they occur. Equally, periodic evaluations provide after-the-fact assurance that the awardee is complying with requirements. Periodic evaluations, such as on-site visits by NSF staff or peer review teams, can more closely examine administrative, financial, and programmatic progress of the award. An agency may thus use either ongoing monitoring or periodic evaluations or a combination of both monitoring activities, depending upon the nature of and the level of risk associated with its award. A monitoring plan that combines ongoing activities and periodic evaluations based on award risk is especially beneficial for agencies with limited resources and travel funds.

Based on our survey, NSF's oversight structure for monitoring the ARR V construction, in our initial understanding, appears adequate. NSF has assigned a program director from the Division of Ocean Sciences within the Geosciences Directorate (GEO) and has assigned a grants and agreements official within the Office of Budget, Finance and Award Management. In addition, the Large Facilities Office (LFO) within NSF's Office of Budget, Finance, and Award Management provides policy guidance for all NSF large facilities. Several components of NSF's oversight of the project are particularly encouraging, including the experience of the NSF officials involved in the project and the ongoing monitoring practices they have in place; the diversity in background and experience of external review panelists and advisory group members who have reviewed the proposal, updated project information, and shipyard selection phases of ARR V; and NSF's planned Business Systems Review of UAF later this year. However, since actual construction has not yet begun on the vessel, we were unable to evaluate at this time

¹ The Committee of Sponsoring Organizations of the Treadway Commission (COSO), in their 1992 study, *Internal Control - Integrated Framework*, linked internal control, organizational objectives, and risk assessment. COSO is a voluntary private sector organization established in 1985 and dedicated to improving the quality of financial reporting through business ethics, effective internal controls, and corporate governance.

whether NSF's oversight will work effectively or be sufficient to ensure that the project is completed on time, on budget, and within performance expectations.

An integral part of NSF's oversight of the project is the collective experience of NSF officials and contractors in the oversight of ship construction and operations, management of large facilities projects, naval architecture, and management and oversight of contracts. The Program Director is primarily responsible for NSF's oversight and continuous monitoring of the construction and operation of the ARRV. He has prior experience overseeing the construction and operation of a research vessel and was specifically hired to bring that experience to NSF. The Program Director performs continuous monitoring of the ARRV project through weekly teleconferences with UAF staff and review of weekly project summaries, bi-weekly cost performance reports, and monthly progress reports. In addition, NSF has hired an independent consultant, a naval architect with experience designing research vessels, to provide input on cost estimates, risk management, and ship designs. Specifically, the Program Director used the services of this consultant to review four independent cost estimates for ARRV construction and to develop a single comprehensive cost estimate. NSF also has retained the services of a former acting section head within GEO's Division of Ocean Sciences as a resident expert to provide project history, corporate memory, and advice to the ARRV Program Director.

Furthermore, NSF and UAF have gathered advisory group members and external review panelists from a variety of fields including naval architecture, project management, oceanographic sciences, business systems, and underwater acoustics to review project plans and outcomes and provide advice. The ARRV Oversight Committee is made up of scientists from a variety of marine science disciplines, as well as marine technical specialists, marine superintendents, and an Alaska Native. This Committee is charged with providing advice to both NSF and UAF on science instrumentation, ship design, and other user-oriented aspects of the ARRV construction. NSF also has set up a Project Advisory Team made up of NSF staff from a variety of divisions. The Project Advisory Team offers advice on business systems and project management to the program director. These advisory groups that are in place will continue to meet and provide advice throughout the life of the project. Additionally, NSF and UAF plan to periodically convene external panel reviews throughout the construction of the ARRV to review progress and provide guidance on the project status and the path forward. For previous external reviews of earlier phases of the ARRV project, panel membership has included naval architects, marine technicians, ship operations experts, scientists from a variety of fields, and project management experts.

Lastly, NSF's ongoing Business Systems Review of the ARRV project is a periodic evaluation coordinated by the LFO. This review will assess whether UAF's business and management systems meet NSF expectations and comply with federal regulations, including Recovery Act requirements, for the ARRV award. LFO initiated the preliminary stages of this review in August 2009 and will conduct a final on-site visit in August 2010. The review will provide NSF with information on UAF's processes and practices in areas such as general management, award management, budgeting and strategic planning, financial management and reporting, human resources, procurement, and equipment and property management. As part of this review, LFO has developed specific procedures to evaluate Recovery Act accounting and reporting practices. For example, NSF will verify that UAF has developed policies, procedures, and appropriate

changes to underlying financial and grant management systems to separately account for and report on Recovery Act funds.

OIG Plans for Future ARRV Reviews

While, in our initial understanding, NSF's oversight structure for monitoring the construction of the ARRV appears adequate, there are areas that we did not analyze or could not verify if they are functioning as intended. Therefore, in order to gain further understanding of the implementation of these oversight measures and to continue our efforts to focus on the prevention of fraud, waste, and abuse in Recovery Act programs, we plan to conduct periodic monitoring of the ARRV project as the vessel is constructed. We will work with NSF to obtain updates on construction progress and will perform more focused reviews on key aspects of the project, such as NSF's monitoring of major milestones and project risks.

Although we are currently refining our monitoring approach, we anticipate that it will include periodic focused reviews and continuous monitoring strategies. As our first focused review, we plan to assess NSF's process for performing the Business Systems Review of UAF and the ARRV project. We will review NSF's scope and methodology, and provide any comments or suggestions for strengthening this important oversight activity. As a continuous monitoring strategy, we will look at the effectiveness of NSF's oversight structure by examining how key individuals and groups communicate and provide direction to the ARRV project. Our plan is to provide comments and suggestions to further strengthen oversight.

Thank you for the opportunity to provide comments on NSF's oversight of the construction of the Alaska Region Research Vessel. We look forward to continuing to work with you as the construction of the ARRV progresses. Should you or your staff have any questions or concerns regarding this information, please feel free to contact Karen Scott at (703) 292-7966 and we will be happy to discuss this with you.

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