NSF Needs Stronger Controls Over Battelle Memorial Institute Award for the National Ecological Observatory Network

NATIONAL SCIENCE FOUNDATION
OFFICE OF INSPECTOR GENERAL

May 12, 2017
OIG 17-3-004

AT A GLANCE

NSF Needs Stronger Controls Over Battelle Memorial Institute Award for the National Ecological Observatory Network

Report No. OIG 17-3-004
May 12, 2017

WHY WE DID THIS INSPECTION

NSF developed five new policy and implementing guidance documents from 2014 to 2016 to address OIG and National Academy of Public Administration recommendations to strengthen controls over its large facility construction projects. In March 2016, NSF selected Battelle Memorial Institute (Battelle) as the new managing organization for National Ecological Observatory Network (NEON) construction and operation and put in place an initial construction cooperative agreement. The Battelle award was made after NSF developed its new policies. We examined this award to assess NSF's progress toward putting its new policies into practice.

WHAT WE FOUND

NSF strengthened some controls over the Battelle award, such as reviewing reasonableness of certain proposed costs and retaining a portion of contingency. In addition, NSF reviewed Battelle's proposed use of management fee and incorporated management fee terms and conditions into the Battelle awards, including requiring Battelle to report on the use of all management fee expended. However, NSF did not fully comply with new policy and implementing guidance to strengthen controls. Specifically, NSF awarded funding to Battelle before completing the cost proposal review documents and was still determining the total estimated cost of NEON in the fall of 2016. NSF also did not have policies in place to prevent the use of its management reserve for costs that do not benefit the award. In addition, although prohibited by policy and/or implementing guidance, management fee was based on a percentage of total estimated project cost, was not finalized before work started, and was allowed to be used for charitable contributions.

This occurred in part because NSF decided that it had to expedite the award to replace NEON, Inc., which NSF determined could not complete construction. Given the NEON project's prior challenges and its transition to a new management company, it is critical that NSF exercise strong management over the project as it moves forward.

WHAT WE RECOMMEND

We made recommendations that NSF strengthen controls over the Battelle project and develop procedures to ensure that controls are in place prior to awarding future large facility awards.

AGENCY RESPONSE

NSF responded that it needed to transition the project quickly to avoid further negative impact to the NEON project and that its expedited evaluation and award process was rigorous, detailed, and well documented. NSF agrees with all but one of our recommendations and is already developing corrective actions.

FOR FURTHER INFORMATION, CONTACT US AT (703) 292-7100 OR OIG@NSF.GOV.

MEMORANDUM

DATE: May 12, 2017

TO: Martha A. Rubenstein
Office Head and Chief Financial Officer
Office of Budget, Finance, and Award Management

FROM: Mark Bell
Assistant Inspector General
Office of Audits

SUBJECT: Final Report No. 17-3-004, *NSF Needs Stronger Controls Over Battelle Memorial Institute Award for the National Ecological Observatory Network*

Attached is the final report on the subject inspection. We have included NSF's response to the draft report as an appendix.

This report contains two recommendations aimed at strengthening NSF's controls over the NEON project and ensuring controls are in place prior to awarding future large facility awards. NSF generally agreed with our recommendations. In accordance with OMB Circular A-50, *Audit Followup*, please provide our office with a written corrective action plan to address the report's recommendations. In addressing the report's recommendations, this corrective action plan should detail specific actions and associated milestone dates. Please provide the action plan within 60 calendar days of the date of this report.

We appreciate the courtesies and assistance NSF staff provided during the inspection. If you have questions, please contact Elizabeth Goebels, Director, Performance Audits, at (703) 292-8483.

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ABBREVIATIONS

Battelle	Battelle Memorial Institute
BEI	Battelle Ecology Institute
CAAR	Cost Analysis and Audit Resolution Branch
CSB	Cooperative Support Branch
DACS	Division of Acquisition and Cooperative Support
GAO	Government Accountability Office
LSST	Large Synoptic Survey Telescope
NAPA	National Academy of Public Administration
NEON	National Ecological Observatory Network

Background

The National Science Foundation (NSF) was established in 1950 as an independent agency responsible for promoting the nation's progress in the fields of science, technology, engineering, and mathematics. Since its beginning, NSF has supported transformative scientific and engineering projects that have produced path-breaking discoveries and new technologies in such areas as molecular biology and geosciences, manufacturing, computer science, and nanotechnology. NSF-supported advances in these fields continue to keep the country at the leading edge of discovery, while also enhancing the social and economic growth of the nation. To support the scientific and engineering enterprise, NSF frequently funds the development of large-scale, multiuser scientific facilities.

NSF developed five new policy and implementing guidance documents from 2014 through 2016[1] to address Office of Inspector General (OIG) and National Academy of Public Administration (NAPA) recommendations to strengthen controls over its large facility construction projects. The Battelle Memorial Institute (Battelle) construction and operations awards — hereafter referred to collectively as the "Battelle award" — for the National Ecological Observatory Network (NEON) project was made after NSF developed its new policies to strengthen management of these projects. Due to our concerns with NSF's oversight of the NEON project, we examined this award to assess NSF's progress toward putting its new policies into practice.

NEON Project

NEON was initially a $433.8 million project, which was to be constructed by NEON, Inc. over a 5-year period from August 2011 through July 2016. Its purpose is to improve understanding of biology; emerging disease; water use; invasive species; and agriculture, forestry, and urban land-use by installing monitoring sites, including towers and instrumentation, across the United States. The project is designed to enable the research community to ask and address questions on a regional to continental scale to increase understanding of the effects of ecological change, land-use change, and invasive species patterns.

Beginning in 2011, auditors identified flaws in NEON, Inc.'s proposed construction budget. Auditors issued three inadequacy memos over a 4-month period in 2011 and issued an adverse opinion on the proposed budget in 2012 because the NEON, Inc. proposal did not form an acceptable basis for negotiation of a fair and reasonable price. The proposal included $154 million in questioned and unsupported costs (36 percent of the total budget). None of the proposed cost elements for labor, overhead, equipment, and other costs reconciled to the supporting data in the proposed budget.

[1] The most current versions of these documents at the time of the Battelle award were: 1) *Large Facilities Manual*, June 2015; 2) Negotiation, Award and Payment of Management Fee, August 31, 2015; 3) *DACS Cooperative Support Branch Standardized Cost Analysis Guidance*, March 1, 2016; 4) *Budget Contingency Obligation and Allocation*, April 30, 2016; and 5) *Guidance on Pre and Post-award Cost Monitoring Procedures for Large Facility Construction and Operations Awards Administered by CSB*, September 15, 2015.

In May 2015, NSF became concerned with schedule variances in NEON's earned valued management reports. When NSF management went on-site to NEON, Inc., in June 2015, project officials informed NSF that the project was facing a potential $80 million cost overrun. As a result, in July 2015, NSF de-scoped the project, which resulted in decreasing the number of monitoring sites from 106 to 82, decreasing the scientific instruments at the sites, and removing an experimental component of the project. According to a panel of outside experts, if NEON is further de-scoped, the project will not meet its full scientific requirements. In December 2015, NSF decided that it needed to replace NEON, Inc. as the managing organization for the Observatory to get the project back on track. In March 2016, NSF selected Battelle as the new managing organization.

In February 2016, prior to being selected for the award, Battelle proposed completing NEON construction for $110 million. According to NSF, it fully expected that these estimated costs were provisional due to the limited time Battelle had to fully vet cost, schedule, and resource information, and that there would be negotiated deviations from the $110 million figure prior to award.

By March 2016, NSF selected Battelle as the new managing organization for NEON construction and operation and put in place an initial construction cooperative agreement. In an effort to get new management in place expeditiously because construction was ongoing, the initial award established a 90-day transition period during which the final costs to construct and operate NEON were to be negotiated with NSF. As previously stated, NSF noted that this arrangement was planned "since costs presented during selection could only be provisional given the urgent need to get new management in place." The award agreement stated the targeted completion date to finalize the total estimated costs was May 20, 2016.

As management of NEON transitioned from NEON, Inc. to Battelle, NSF determined it would need additional funding to complete NEON. On June 29, 2016, the NSB approved an increase of $35.5 million for NEON construction, raising the total estimated costs of the NEON project to $469.3 million. The revised total project cost also included $3.2 million in management reserve held by NSF to manage risks identified by the agency, as opposed to funds for risks that were held and managed by Battelle. NSF notified Congress in July 2016 that it would transfer funding from its Research and Related Activities account to its Major Research Equipment and Facilities account to cover the increased costs. At the time of the NSB approval and notification to Congress, NSF was still negotiating the final total estimated costs for the Battelle award. In addition, NSF was determining final contingency amounts at the end of our fieldwork on October 13, 2016.

Results of Inspection

NSF followed certain strengthened key management procedures during the Battelle award, such as reviewing proposed costs, obtaining an independent cost estimate, including management fee terms and conditions in Battelle's award, and retaining a portion of contingency. However, NSF did not have complete project cost information, did not have management reserve policies in place, and did not fully apply other key management fee policies and procedures. This occurred in part because of NSF's decision to expedite the award to replace NEON, Inc., which NSF determined could not complete construction. NSF also determined that further delays in transitioning to a new awardee — and the

associated additional costs NSF would incur if such a transition required halting the construction process — would have further increased the potential of cost overruns. Given the NEON project's prior challenges and its transition to a new management company, it is critical that NSF exercise strong management over the project as it moves forward.

NSF Strengthened Some Controls Over Battelle Award

NSF strengthened some controls over the Battelle award, such as reviewing reasonableness of certain proposed costs and retaining a portion of contingency. In addition, NSF reviewed Battelle's proposed use of management fee and incorporated management fee terms and conditions into the Battelle awards, including requiring Battelle to report on the use of all management fee expended.

NSF Assessed Reasonableness of Some of the Costs Proposed by Battelle

In response to a 2012 NSF OIG alert memo,[2] NSF agreed to complete a Cost Proposal Review Document (CPRD) for each large facility proposal to ensure that a thorough and well-documented record exists of NSF's determination that proposed costs are reasonable. The CPRD is NSF's analysis of whether an awardee's proposed costs are reasonable and describes NSF's plans for oversight of the award. In June 2014, NSF issued its first version of the NSF *DACS Cooperative Support Branch Standardized Cost Analysis Guidance*. The guidance requires grants officers for large facilities to sample certain proposed costs, such as labor and equipment costs; obtain an independent cost assessment;[3] and complete a CPRD.

At NSF's request, Booz Allen Hamilton completed an independent cost estimate of the Battelle construction proposal in March 2016. NSF included the results of this assessment in its CPRD for the construction award as required. In addition, the grants officer reviewed the reasonableness of certain proposed costs and completed a CPRD.

NSF Retained a Portion of Contingency

Contingency is part of the awardee's proposed budget estimate to cover future costs associated with events that might occur in the future and which could increase the costs of the approved project. We have recommended since 2012 that NSF strengthen controls over contingency funds, including for NSF to retain a portion of contingency funds. In December 2015, NAPA recommended NSF "retain control of a portion of an award recipient's contingency funds and distribute them with other incremental funds as needed."

On April 30, 2016, NSF issued *Budget Contingency Obligation and Allocation*, which implemented the NAPA recommendation to retain a portion of contingency. This new guidance requires the NSF Large Facility Office and Chief Financial Officer to approve the allocation of contingency to the awardee and

[2] OIG 12-6-001, *NSF's Management of Cooperative Agreements*
[3] According to the Government Accountability Office (GAO), the most comprehensive of the *GAO Cost Estimating and Assessment Guide*'s assessment tools is the independent cost estimate.

determine which portion to retain at NSF. Battelle's proposal requested $8.9 million in contingency. We found NSF complied with this new guidance for the construction award when allocating $1 million of the requested $8.9 million in construction contingency to Battelle and retaining the rest. Specifically, both the Large Facility Office and Chief Financial Officer approved the $1 million allocation prior to its release to Battelle.

NSF Followed Some of its Management Fee Policies

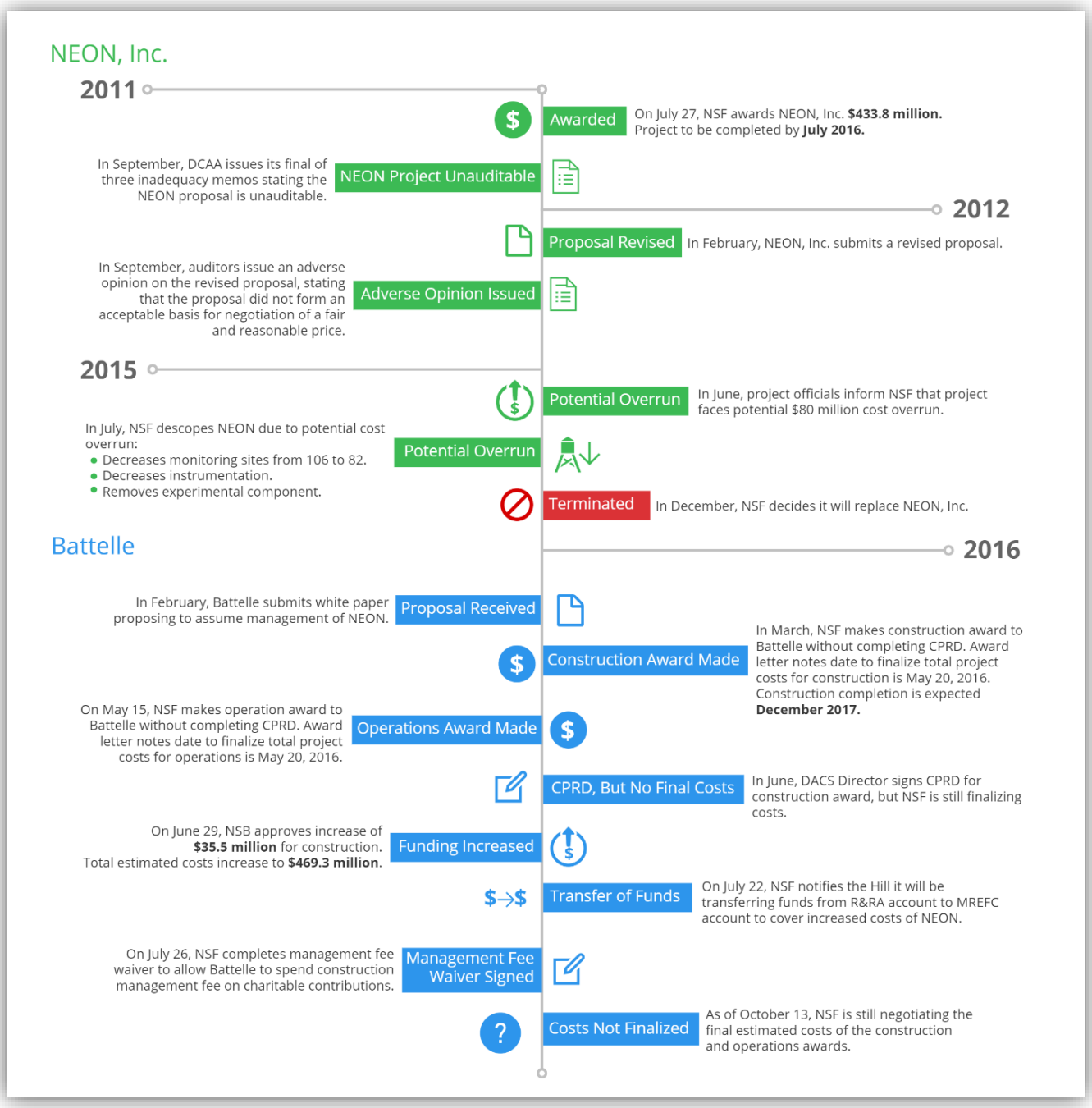
NSF followed some of its management fee policies. For example, NSF reviewed Battelle's proposed use of management fee and incorporated management fee terms and conditions into the Battelle awards, including requiring Battelle to report on the use of all management fee expended.

On August 31, 2015, NSF issued its standard operating guidance on management fee, *Negotiation, Award and Payment of Management Fee.* The guidance requires the NSF grants officer to require that the awardee set forth their management fee request in writing. NSF did receive and review this written documentation from Battelle. Further, the management fee guidance requires the grants officer to include specific management fee terms and conditions in the award letter including requiring the awardee to report on all management fee expended under the agreement 60 days prior to the end of the performance period covered by the management fee. NSF included these terms and conditions in both the construction and operations award letters.

NSF Awarded Funding to Battelle Prior to Finalizing the Total Estimated Costs of the Project

NSF awarded funding to Battelle before completing the cost proposal review documents. In addition, although NSF awarded the construction and operations award in the spring of 2016, NSF was still determining the total estimated cost of NEON in the fall of 2016, as shown in Figure 1.

Figure 1: Timeline of NEON Project Activities



Source: NSF OIG depiction of NSF and NSF OIG data

NSF Did Not Fully Complete Reviews of Construction and Operations Funding Prior to Award

NSF's *DACS Cooperative Support Branch Standardized Cost Analysis Guidance*, March 1, 2016,[4] states that as part of the CPRD approval, the grants officer must assess and determine that a project's estimated costs are reasonable prior to making an award to support construction of a particular facility. As previously discussed, NSF's grants officer completed a CPRD for the construction award. However, the Director of DACS did not approve the CPRD until June 22, 2016, after NSF awarded funding for the construction award to Battelle in March 2016, and after the May deadline by which NSF said it would finalize costs.

NSF continued to negotiate the final total estimated costs of the construction award after it was made, including final contingency amounts. According to NSF, Battelle's original proposed costs were provisional, and NSF needed to award funds prior to finalizing total costs due to the urgent need to get a new management organization in place for NEON in the middle of construction. The original award to Battelle targeted May 2016 as the completion date to finalize project costs for the award. Due to changing award amounts, the Battelle construction award incorrectly lists the total projected cost of the award agreement at $111,633,195 instead of $117.6 million due to system limitation issues associated with the NSF automated award system.

NSF also requires a CPRD for operations awards valued at more than $100 million, but as of August 30, 2016, NSF had not completed a CPRD for the NEON operations award. NEON operations are expected to cost more than $172.2 million over 26 months, and as of July 2016, NSF had awarded nearly $7 million in operations funding to Battelle without completing the CPRD for operations. Without a CPRD prior to the start of the operations award, NSF may provide funding to Battelle for costs that are not necessary, reasonable, or allowable. Additionally, NSF must ensure it commits sufficient funding to cover operation costs.

Proposed Construction Budget for NEON Included Unsupported Costs

As previously mentioned, the NSF grants officer assessed the reasonableness of Battelle's proposed costs and documented her conclusions in a CPRD. However, we found costs in Battelle's proposed construction budget for equipment, materials and supplies, sub-awards, consultants, and other direct costs were not supported with adequate documentation. The CPRD noted a total of $2.5 million (25 percent) of $10 million in sampled costs that were not supported by vendor quotes or historical cost information.

For $892,000 of the unsupported costs, Battelle gave its NSF grants officer additional information, such as the dollar amounts of past purchases, to support the amount requested. However, Battelle did not provide the grants officer the purchase orders or invoices to confirm these amounts. The grants officer stated she took some of Battelle's proposed amounts at face value because, in her view, the amounts were low risk, and NSF needed to make the award quickly.

[4] NSF first issued the guidance in June 30, 2014.

The NSF program officer responsible for monitoring the Battelle award reviewed the remaining $1.6 million of the unsupported costs. The program officer's determination on whether the proposed costs were reasonable consisted of an email stating that the requested costs "seemed reasonable." The program officer did not have any written documentation to support his conclusion and told us that he determined the reasonableness of costs based on his past experiences.

According to NSF internal guidance, it is acceptable to rely on personal knowledge and expert opinion when analyzing costs; however, the guidance also requires that "the basis for any conclusions must be documented." Further, the *GAO Cost Estimating and Assessment Guide* states that "…because of its subjectivity and lack of supporting documentation, expert opinion should be used sparingly and only as a sanity check."

According to NSF, varying levels of support were available for the elements of costs, which it believes is understandable considering the abbreviated time available to finalize the award. They indicated they had to use the best information available at the time of the award to assess reasonableness.

However, it is crucial that NSF ensure Battelle's proposed costs are supported and include detailed cost information so NSF can award sufficient funding to accomplish the NEON's objectives. Supporting documentation helps ensure costs are reasonable and allocable to the award — without such information, there is a greater risk that inappropriate charges could be made.

NSF Review of Proposed Subcontract and Consultant Services is Incomplete

The NEON award is currently being executed by Battelle while NEON, Inc., now known as Battelle Ecology Institute (BEI), serves as a subcontractor. The nature of the relationship between NEON, Inc., Battelle, and other organizations working on the NEON construction determines how certain indirect costs should be applied to the award and when certain changes require NSF approval. The proposed budget includes more than [redacted] for subcontracts and consultant services.

NSF's CPRD notes that NEON, Inc. had problems in the past with the consistent classification of consulting and contract costs and the application of indirect rates to these costs. Past Cost Analysis and Audit Resolution Branch (CAAR)[5] reviews noted NSF was concerned that NEON, Inc.'s treatment of consulting services could potentially distort the allocation base of indirect expenses and could increase the indirect costs charged to the Battelle award. Specifically, indirect costs apply to the full amount of consultant services but only apply to the first $25,000 of subawards.

Further, NSF's cooperative agreement includes certain terms and conditions for subcontracts. Specifically, the cooperative agreement states, "Prior approval by the cognizant NSF Program Officer and the NSF Grants and Agreements Officer is required for: i. Re-budgeting of funds among subawardees/subcontractors exceeding $250,000 at the Level 2 WBS [Work Breakdown Structure]."

[5] In the spring of 2017, NSF reorganized CAAR into two new branches: the Cost Analysis and Preaward Branch (CAP) and the Resolution and Advanced Monitoring Branch (RAM).

NSF acknowledged in its CPRD the importance of properly classifying costs to ensure consistent application of indirect costs. However, as noted in the CPRD, further analysis and coordination within NSF is required to ensure Battelle is consistently and properly classifying consultant service costs. Accordingly, NSF cannot be sure Battelle or BEI is not misclassifying its more than [redacted] in subcontracts and consultant services costs.

In addition, BEI-specific costs reflected the NSF-approved provisional indirect cost rate [redacted] percent previously negotiated with NEON, Inc. According to NSF management, the evolving relationship and structure between Battelle and BEI may result in changes to this rate. This matter is still being reviewed by the agency.

Without a complete review of costs, fully supported costs in the proposed budget, and finalized indirect cost information, NSF cannot be assured that it is allocating sufficient funding to complete the project's objective or that costs are reasonable.

NSF Lacks Controls Over Use of Management Reserve

NSF is maintaining a $3.2 million management reserve held by the agency (as opposed to Battelle), for the NEON project to cover risk identified by the agency, such as environmental compliance and potential liabilities. According to the *GAO Cost Estimating and Assessment Guide*, while management reserve is typically held at a high level, "it must be identified and accounted for at all times."

NEON is the first large facility project for which NSF has held management reserve. However, NSF had not developed policies and procedures before implementing the management reserve process. Unlike budget contingency, NSF does not have policies and procedures for how it can use the management reserve or who at NSF can approve its use. NSF also does not have a mechanism to track how it uses the funds. The head of the Large Facilities Office confirmed that NSF did not have policies for oversight and use of the management reserve. He also said that NSF senior management has not decided how the reserve funds will be allocated if project risks do not materialize.

As a result, NSF lacks controls to prevent the management reserve from being used for costs that do not benefit the NEON award. Additionally, without appropriate procedures to control when and how NSF spends management reserve, there is a risk that sufficient reserve funds may not remain for risks that occur later in the project.

In February 2017, NSF stated it had not yet allocated any of the management reserve to the directorate overseeing NEON, and that NSF "will not obligate any portion of the management reserve until a bona fide need is realized that aligns with the NSF-held risks and uncertainties previously identified." The Foundation agreed it should develop standard internal operating guidance before NSF obligates any of the management reserve.

NSF Implemented Controls Over Contingency Funds Provided to Battelle After Award

The contingency management plan and change process are important controls to help ensure that contingency funds are spent properly. The contingency management plan describes how the recipient will manage and allocate contingency; the *Large Facilities Manual* indicates such a plan should be completed before an awardee expends construction funds. However, NSF awarded $1 million in contingency to Battelle for its construction award without having finalized the contingency management plan/change control process required by NSF's *Large Facilities Manual*. In September 2016, the head of the Large Facilities Office stated the contingency management plan had not been finalized. He explained that this is why the reference to the change control documents in the Battelle construction award state "TBD" [to be determined].

In response to our discussion draft report, NSF notified us that Battelle and NSF had finalized the change management plan on November 15, 2016, after our fieldwork ended. In addition, NSF stated it awarded the $1 million in contingency to Battelle because it believed the risk of mismanagement of the contingency was low due to existing NSF controls; specifically, Battelle is required to report monthly on its contingency use and is operating under the contingency management plan of NEON, Inc., the previous managing organization.

NSF did not include in the construction award terms and conditions the threshold amount at which Battelle would need approval from NSF to expend contingency. As a result of our inspection, the NSF grants officer promptly modified the construction award agreement to require NSF to approve contingency expenditures of $150,000 or more.

Since the end of our fieldwork, NSF has addressed our concerns over contingency. However, to strengthen its oversight over contingency in the future, NSF should ensure the contingency management plan and terms and conditions are finalized prior to award to help ensure that contingency funds are spent properly.

NSF Could Improve Compliance with Management Fee Policy

In December 2014, NSF issued a new management fee policy to strengthen its oversight over awardees' use of management fee. The fee policy was subsequently updated and finalized in June 2015. We reviewed the inclusion and proposed use of [redacted] of management fee — [redacted] for construction and [redacted] for operations — in the Battelle award to determine if NSF followed its June 2015 management fee policy[7] and NSF's guidance implementing that policy.[8]

As previously discussed, we found NSF followed some of its management fee policies, such as requiring Battelle to report on the use of all management fee expended. However, we also found that NSF waived

[6] After our fieldwork ended, NSF decreased the management fee for the operations award to [redacted].
[7] *Large Facilities Manual*, NSF 15-089, June 2015.
[8] NSF's Standard Operating Guidelines *Negotiation, Award and Payment of Management Fee*, 2015-1.

or did not require full compliance with other management fee policy and/or implementing guidance. Specifically, NSF allowed management fee to be used for charitable contributions and at award issuance based management fee on a percentage of total estimated project cost. In addition, work started under the award before management fee amounts were finalized. As a result, management fee could be used for expenses that do not directly relate to the construction and operations of NEON.[9]

NSF Use of Management Fee

In 2015, the NSF Director and the National Science Board (NSB) requested NAPA review several issues related to our audit findings, including NSF's cost surveillance approaches under cooperative agreements and the agency's oversight of contingency and management fee. In its December 2015 report, NAPA recommended that NSF discontinue including management fee in NSF awards. NSF committed to implementing all NAPA recommendations "in some form."

According to NSF, NSF studied NAPA's recommendations and determined the costs typically covered by management fees could not be covered by other cost categories such as indirect costs. Further, NSF stated it found that not allowing fee for performance of work could disadvantage NSF awardees and would not incentivize highly qualified organizations to compete to manage NSF projects. As a result, in a November 2016 presentation to the NSB, NSF stated that it is not discontinuing management fee and instead plans to adopt fees consistent with those typically provided in government contracting.

NSF Granted Waiver to Allow Use of Management Fee for Charitable Contributions

Management fees, unlike profits or incentive fees, have long been recognized as a means to provide the awardee with funds for the limited purpose of covering certain unallowable ordinary and necessary expenses needed to maintain financial viability.[10] Rather than limiting "ordinary and necessary" expenses to those necessary for "financial viability," NSF's June 2015 policy more broadly allows "management initiative and investments that will directly or indirectly benefit the NSF-funded activity." However, NSF's implementing guidance prohibits the use of management fee for certain activities, such as charitable contributions.

[9] The *American Innovation and Competitiveness Act of 2017* states, "It is the sense of Congress that – the Foundation should implement an award fee policy that ensures…funding of necessary and appropriate expenses directly related to the construction and operation of major multi-user research facilities." We note that this Act was enacted in January 2017 and was not in effect at the time of NSF's decision regarding charitable contributions.

[10] *See* NSF OIG White Paper on Management Fee (Nov. 24, 2014); *General Accounting Office [now Government Accountability Office] (GAO)1982 report entitled Fee Guidelines Still Needed for Government-Sponsored Nonprofit Organizations*, GAO/PLRD-82-54 (July 1982). We note that in addition to management fee use for ordinary and necessary expenses to maintain financial viability, management fee has traditionally been used for certain operating capital expenditures.

NSF will permit Battelle to spend $578,000 of the $[redacted] in management fee for the construction award and $862,000[11] of the [redacted] in management fee for the operations award on charitable contributions, which is prohibited in NSF's implementing guidance. As permitted in its implementing guidance, NSF officials authorized waivers to allow Battelle to use management fee for charitable contributions. The DACS Director granted a waiver in July 2016 to allow Battelle to use its construction management fee on charitable contributions and another waiver in November 2016 to allow use of its operations management fee on charitable contributions.

The DACS Director acknowledged in the waiver that implementing guidance differed from NSF's policy (contained in NSF's *Large Facilities Manual*) on charitable contributions, and expressly granted a deviation from the guidance.[12] We are concerned that this discrepancy could create confusion about whether NSF prohibits the use of management fee for charitable contributions.

NSF officials told us that charitable contributions were an important component of Battelle's core mission, and that Battelle typically receives fees that it can use without restriction, including for charitable contributions. NSF officials told us that management fee helps ensure that high quality organizations, such as Battelle, will compete to run NSF facilities. They also said that if NSF did not allow management fee, NSF's "interests" would not be served.

NSF officials also referred to Battelle's procurement contract awards as part of the rationale for exempting Battelle from the restriction on charitable contributions. However, this is an imperfect comparison. The Federal Acquisition Regulation governs procurement contracts and authorizes profit and incentive-type fees that the contractor can use without restriction. By contrast, management fee awards under NSF cooperative agreements are governed by NSF policy for limited purposes and use.

Due to NSF's exemptions, Battelle can spend $1.4 million for charitable contributions. However, if the total project cost increases, the amount available for charitable contributions could increase due to the percentage-based management fee amount.

NSF indicated it would include examples of inappropriate uses of management fees in its revised policy. However, it is unclear whether NSF would prohibit the use of management fee for charitable contributions in its revised policy. It is noteworthy that the *American Innovation and Competitiveness Act of 2017* states, "It is the Sense of Congress that … the Foundation should implement an award fee policy that ensures more transparency and accountability in the funding of necessary and appropriate expenses directly related to the construction and operation of major multi-user research facilities." [13] NSF's waiver acknowledged the charitable contributions were not for the direct benefit of the NSF funded activity.

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[11] After our fieldwork ended, NSF decreased the amount of the management fee for the operations award to [redacted]. Battelle did not submit a revised management fee proposal; accordingly, it is unclear how much Battelle will spend on charitable contribution for the operations award.

[12] The *Large Facilities Manual* requires "expenditures of management fee . . . [to] directly or indirectly benefit the NSF-funded activity," but does not exclude using management fee for charitable contributions. In contrast, SOG 15-1 states that management fee shall not be used for general charitable contributions.

[13] Pub. L. No. 114-329. § 110(e)(1)

NSF Approved Management Fee Based on a Percentage of Costs

At the time of award, management fee in the Battelle award was based on a percentage of estimated total project costs, although both NSF policy and implementing guidance prohibit basing management fee solely on a percentage of total estimated project cost. According to NSF's *Large Facility Manual*, "… agreement on management fee amounts shall be completed and a specific dollar amount established prior to the initiation of work under an award." NSF's implementing guidance, *NSF's Standard Operating Guidelines Negotiation, Award and Payment of Management Fee*, 2015-1 clarifies that "Fee amounts shall not be based solely on a percentage of the estimated costs."

NSF implementing guidance allows the Director of the DACS to waive management fee requirements. However, the DACS Director did not issue a waiver to allow NSF to base Battelle's management fee on a percentage of estimated total project costs as opposed to a specific dollar amount prior to the initiation of work under the award.

The management fee structure does not give Battelle an incentive to control costs. Because Battelle's management fee is based on a flat percentage, if NEON project costs rise, the [redacted] management fee for construction and the proposed [redacted] management fee for operations could be higher. Finally, it is worth noting that the fee Battelle is receiving is substantially larger than what NSF usually pays. Management fee for the Battelle award is [redacted] of total estimated project costs; historically, management fee on NSF awards has ranged between 0 and 1 percent of total estimated project costs.

Work Started under Battelle Award Prior to NSF Finalizing Management Fee Amounts

Both NSF policy and implementing guidance require NSF to review the awardee's management fee proposal to determine the need for and specific amount of the fee before the awardee begins work. NSF's *Large Facility Manual* states, "Agreement on management fee amounts shall be completed and a specific dollar amount established prior to the initiation of work under an award."

However, work started under the NEON construction award in March 2016 and the operations award in May 2016 before management fee amounts were finalized. Specifically, NSF awarded $1,114,876 in management fee for the construction award between March 2016 and July 2016 before finalizing Battelle's management fee and waiving its management fee policy in a July 26, 2016 memo. NSF also awarded $263,508 in management fees to the Battelle operations award between May 2016 and July 2016 without NSF finalizing fee amounts. Our review of NSF's July 2016 memorandum confirmed that the memorandum did not address the basis for allowing work to begin prior to establishing the management fee.

Further, NSF continues to negotiate the final total estimated project costs for both the construction and operations awards. As a result, the award agreements indicate that NSF may adjust the management fee amount.

NSF Awarded Management Fee to Battelle without Drawdown Schedule

Battelle did not submit a drawdown schedule detailing when it would request management fee for its construction and operations awards and the amounts it expected to request, as required by NSF's implementing guidance. According to NSF's implementing guidance, "Awardees shall include in their fee proposal a Schedule for drawing fee, based on the organization's approved use of fee and approximately when those needs are expected to arise or must be met." NSF's deviation memo did not address the agency's rationale for awarding management fee absent the required drawdown schedule. As a result, NSF has less insight into when and how Battelle is using the management fee.

Other Matter: Financial Viability Assessment

A financial viability assessment evaluates key indicators that rate an entity's financial capability. According to NSF's March 1, 2016 *DACS Cooperative Support Branch Standardized Cost Analysis Guidance*, the grants officer is required to request that CAAR, which is under the Division of Institution and Award Support, conduct this assessment for non-profits that have NSF large facility awards. [14] However, the grants officer did not request that CAAR conduct the financial viability assessment for Battelle; instead, the Cooperative Support Branch (CSB), which is under the DACS, conducted this review during NSF's selection process for a new management entity for the NEON project. The DACS Director stated that CAAR did not conduct the financial viability review because NSF had to rely on an expedited process to review the Battelle award.

A CAAR financial viability assessment evaluates an organization's current ratio (current assets divided by current liabilities), annual revenues or losses, liquid assets, and notes to financial statements. If CAAR's initial analysis identifies concerns, CAAR may require additional information to assess the organization's financial viability such as cash flow forecasts or projections; names of potential investors or backers; future funding increments or pending proposals and likelihood of funding, loans, advances, and lines of credit; details on liabilities; or notes payable held by principals of the organization.

The CSB review did not find any material financial issues that would affect Battelle's ability to successfully execute the NEON award. To complete its review, CSB reviewed past A-133 audit reports, indirect cost rate information, prior awardee performance reports, and information from cognizant agencies. Although CSB's documentation indicates it reviewed Battelle's current ratios, notes to the financial statements, and annual revenues/losses, it did not document a review of Battelle's liquid assets. CAAR staff explained that it would be important to review Battelle's liquid assets to determine whether Battelle could use those assets to sustain any losses throughout the NEON award. CSB's documentation does not say that it reviewed other information such as cash flow forecasts or the likelihood of future funding; CSB also did not recommend any extra steps to protect NSF's interests.

NSF's *DACS Cooperative Support Branch Standardized Cost Analysis Guidance* states that where CAAR deems an awardee to have limited financial viability, the NSF grants officer must take steps to protect NSF's interests, such as including prior approval of amounts advanced or special payment

[14] NSF first issued the guidance in June 30, 2014.

provisions. Without a CAAR financial viability review, NSF may not identify situations in which it is necessary to take steps to protect its interests.

Conclusion

Given the NEON project's prior challenges — which include millions in cost overruns, reduced scientific benefits, and the transition to a new management company — the risk of future challenges is significant, and the project's ability to absorb further cost or scope reductions is quite limited. It is therefore critical that NSF exercise strong management over the project as it moves forward.

We recognize that NSF concluded it needed to take swift action to get a new managing organization in place to continue construction. However, it also has a responsibility to ensure the financial viability of the project. By not following many of its new policies and procedures, NSF may put NEON at risk for future cost increases or additional de-scoping, both of which would undermine the project's ability to deliver transformative science.

Recommendations

1. We recommend that the NSF Chief Financial Officer strengthen controls over the Battelle project to include:

1. Developing policies and procedure for NSF's use of management reserve.
2. Enforcing NSF's current management fee policies and procedures, including:
    a. Disallowing Battelle's use of management fee for charitable contributions.
    b. Awarding management fee for ordinary and necessary expenses for a specific amount, not based on a percentage of total estimated costs.
    c. Finalizing the management fee amounts for operations and construction as soon as possible.
    d. Requesting and reviewing a draw down schedule from Battelle for the construction and operations award.
3. Finalizing the Cost Proposal Review Document for operations.
4. Ensuring a complete review of BEI's and Battelle's relationship and thoroughly reviewing consultant services and subcontracts.
5. Finalizing total estimated costs for the construction and operations award.
6. Completing a more thorough financial viability assessment.

2. We recommend the NSF Chief Financial Officer develop procedures to ensure that controls are in place *prior* to awarding future large facility awards including:

1. Award amounts including management fees are established.
2. Cost Proposal Review Documents are completed.
3. Costs are adequately supported.
4. Contingency management plans are developed.

5. Contingency thresholds and terms and conditions are included in award agreements.
6. Thorough financial viability assessments are completed by CAP.

OIG Evaluation of Agency Response

NSF responded that it needed to transition the project quickly to avoid further negative impact to the NEON project and that its expedited evaluation and award process was rigorous, detailed, and well documented. While NSF determined that it needed to transition the project quickly, NSF also has a responsibility to ensure the financial viability of the NEON project. As documented in the audit report, NSF did not fully comply with new policy and implementing guidance to strengthen controls, which may put the NEON project at risk.

NSF agrees with all but one of our recommendations and is already developing corrective actions. NSF did not agree to disallow Battelle's use of management fee for charitable contributions. NSF's decision is in contrast with NSF's implementing guidance, which prohibits the use of management fee for charitable contributions. Also we note that continued use of management fee for this purpose does not appear consistent with congressional intent expressed in section 110(e)(1)(B) of the *American Innovation and Competitiveness Act of 2017*, which contemplates use of fees for "expenses directly related to the construction and operation of major multi-user research facilities." We note that this Act was enacted in January 2017 and was not in effect at the time of NSF's decision regarding charitable contributions. NSF's response is included in its entirety in Appendix A.

Appendix A: Agency Response

National Science Foundation
4201 Wilson Boulevard, Arlington, Virginia 22230

Memorandum

DATE: May 8, 2017

TO: Mark Bell
Assistant Inspector General
Office of Audits

FROM: Martha A. Rubenstein Marty
Chief Financial Officer and Office Head
Office of Budget, Finance and Award Management (BFA)

SUBJECT: NSF's Response to OIG Official Draft Report, *NSF Needs Stronger Controls Over Battelle Memorial Institute Award for the National Ecological Observatory Network*

Thank you for the opportunity to provide comments on the Official Draft of the Office of Inspector General (OIG) Report regarding NSF controls over the Battelle Memorial Institute (Battelle) Award for the National Ecological Observatory Network (NEON). In our view, the Official Draft Report does not fully capture the circumstances that required NSF to act expeditiously to successfully transition an at-risk project in the middle of construction. These circumstances required that we implement streamlined procedures, yet those procedures were rigorous, documented, and ensured the proper stewardship of Federal funds. To accurately reflect NSF's position on this matter, we request that the following Agency Response summary be included, as stated here, in the "At a Glance" section of the Report:

> NSF believes it was necessary to complete a successful transition of the project as quickly as possible, without further negative impact to cost or schedule. Our expedited evaluation and award process was rigorous, well documented, and included the evaluation of detailed budget information that ensured a reasonable cost and fee was established for both construction and initial operations. NSF agrees with all but one of the OIG recommendations and is already developing corrective actions.

Our response to the Draft Report is provided in two parts. First, we address the recommendations set forth in the Draft Report, and note that with one exception, NSF agrees with the recommendations; they are consistent with actions already taken or agency procedures already in place for managing major facility awards. Second, we address key issues raised within the body of the Draft Report that are not addressed through the recommendations.

Since this Initial response is based on the text of the Draft Report provided to date, we would also request the opportunity to update our comments based on any further substantive revisions to the Report prior to issuance. Considering the fact that the Draft Report raises issues concerning the financial viability of the awardee that will be publicly posted by the OIG, we also

request that consideration be given to a process that would allow the awardee to respond directly to aspects of the Draft Report.

Part I: NSF's Responses to the OIG's Recommendations

Following careful review of the OIG's recommendations, NSF's responds as follows:

OIG Recommendation 1: We recommend that the NSF Chief Financial Officer strengthen controls over the Battelle project to include:

1.1 Developing policies and procedures for NSF's use of management reserve.

NSF Response: Agree. NSF agrees that management reserve policies and procedures will be finalized prior to the transfer of any funds used for that purpose. Since there have been no calls on management reserve and funds will not be obligated before these procedures are finalized, no risk to the agency currently exists. The target date for completion of policies and procedures is July 31, 2017.

1.2 Enforcing NSF's current management fee policies and procedures including:

a. Disallowing Battelle's use of management fee for charitable contributions.

NSF Response: Disagree. Battelle is an applied science and technology development company established as a nonprofit charitable trust exempt from taxation under Section 501(c)(3) of the internal Revenue Code because it is organized for charitable, scientific and education purposes. NSF executed a deviation to internal agency policies and procedures that properly documented the need to provide a reasonable fee to Battelle to complete the NEON project, including uses of fee consistent with the organization's mission. To void NSF's agreement with Battelle to provide fee as currently established in the NEON awards would not provide a positive incentive for Battelle's successful completion of the NEON project. Further, it is noted that, through the terms of the implementing cooperative support agreements, Battelle is still restricted on its use of fee (including for alcoholic beverages, entertainment, or lobbying activities as set forth at 2 C.F.R. § 200.450, as appropriate to the recipient type). The award terms further require Battelle to separately track and make available information to NSF on the actual uses of fee and NSF retains the authority to reduce fee for non-compliance with these restrictions.

b. Awarding management fee for ordinary and necessary expenses for a specific amount, not based on a percentage of total estimated costs.

NSF Response: Agree. Although a percentage formula was initially used by Battelle to calculate proposed fee under the construction and initial operations awards, which is consistent with established commercial practices, the final fees under both awards set forth were fixed dollar amounts (not percentages) that were identified by Battelle for discrete uses that were reviewed for appropriateness by NSF. Fee is not subject to

revision based on actual costs incurred, but may be re-negotiated by NSF and Battelle based on changed work requirements.

c. Finalizing the management fee amounts for operations and construction as soon as possible.

NSF Response: Agree. Management fee amounts for initial operations and construction were finalized concurrent with the finalization of costs for both awards, prior to issuance of the Official Draft Report.

d. Requesting and reviewing a draw down schedule from Battelle for the construction and operations award.

NSF Response: Agree. NSF agrees that a draw down schedule was not initially established as required by agency procedures. We appreciate the OIG bringing this matter to our attention, and we have since requested that Battelle provide a proposed draw down schedule for NSF's consideration. We note that this matter relates only to the timing of fee distribution during the performance period, and has no bearing on the fee amount, which as previously stated is established as a fixed dollar amount.

1.3 Finalizing the Cost Proposal Review Document (CPRD) for operations.

NSF Response: Agree. The CPRD for initial operations was definitized on November 6, 2016.

1.4 Ensuring a complete review of Battelle Ecology Inc.'s (BEI's) and Battelle's relationship and thoroughly reviewing consultant services and subcontracts.

NSF Response: Agree. As more fully addressed in a subsequent section of this document, the BFA Division of Institution and Award Support (DIAS) is responsible to provide oversight of awardee and subawardee cost information to ensure proper review of costs for reasonableness, allowability, and allocability.

1.5 Finalizing total estimated costs for the construction and operations award.

NSF Response: Agree. The construction award amount was finalized on July 27, 2016, with the exception of three specific anticipated adjustments that represented a small portion of the work effort (approximately $8M of the $125M estimate). These requirements were subsequently definitized in December 2016. The initial operations award was definitized in November 2016.

Prior to definitization, NSF established initial incremental funding amounts for release to Battelle to ensure continued critical performance requirements pending award finalization. These increments were evaluated for reasonableness by NSF, were limited in their duration, and were executed with the explicit understanding that the

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increments would be superseded by final negotiated amounts after the final budget review.

1.6 Completing a more thorough financial viability assessment.

NSF Response: Agree. NSF completed a review of the financial viability of Battelle prior to award of the construction and initial operations awards, and considers that review to be adequate to determine the financial viability of the awardee. However, since NSF is currently in the process of negotiating an award supplement with Battelle for extended NEON operations, the agency will ensure that additional financial viability reviews will be conducted in coordination with BFA's DIAS.

OIG Recommendation 2. We recommend the NSF Chief Financial Officer develop procedures to ensure that controls are in place *prior* to awarding future large facility awards including:

2.1 Award amounts including management fees are established.
2.2 Cost Proposal Review Documents are completed.
2.3 Cost are adequately supported.
2.4 Contingency management plans are developed.
2.5 Contingency thresholds and terms and conditions are included in award agreements
2.6 Thorough financial viability are completed by the Cost Analysis and Pre-Award Branch (CAP).

NSF Response: Agree in principle to Recommendation 2, sub-parts 1-6. The controls enumerated above are consistent with procedures already in place at NSF. The OIG's emphasis for this recommendation is that these controls are in place prior to awarding future major facility requirements. We fully concur with the intent of this recommendation, with the caveat that NSF (like all Federal agencies) requires the flexibility to deviate from standard operating procedures when those deviations are warranted due to the exigency of the circumstance, are fully documented, and include controls to ensure proper management of the project and associated costs.

Part II: NSF's Responses to Key Issues in the OIG's Draft Report

In addition to our responses to the recommendations set forth in the Draft Report, and to provide context, NSF also considers it important to address a number of issues raised within the body of the Draft Report but not brought forward in the recommendations. Most significantly, NSF notes that the most current construction performance metrics (Earned Value Management data), with less than one year remaining in the construction stage, indicate an on-budget completion of the NEON project under Battelle's management.

The Draft Report states that NSF did not fully comply with its policies by awarding funds prior to the definitization of costs and before having policies in place to properly manage management reserves. In fact, NSF acted properly in providing initial funding prior to definitizing final award costs. To have suspended construction pending award finalization would have added millions of dollars in additional costs that were avoided by NSF's action. The authority for awardees to

expend funds prior to finalization of award amounts is recognized for financial assistance awards at 2 C.F.R. § 200.458 (Pre-award costs) and more generally, 42 U.S.C. § 1870(c). NSF fully documented the need to place initial funding under the initial award to meet critical near term requirements pending definitization through the Award Memorandum signed by the Division Director, BFA Division of Acquisition and Cooperative Support. Further, NSF imposed more rigorous controls than standard for financial assistance awards by providing initial funding through an award action that limited Battelle work effort to the minimum requirements necessary to continue progress under the project without further impacting cost and schedule. Initial increments of funds were based on estimates that were reviewed for reasonableness by the Grants Officer and included not-to-exceed amounts for each increment approved. Although the OIG indicates that an excessive period lapsed prior to finalization of costs, most costs associated with construction, and all costs associated with operations, were finalized within the 180-day standard for undefinitized award actions that is used by the Department of Defense, the Department of Energy, and the National Aeronautics and Space Administration.

The Draft Report states that fee was based on a percentage of cost, not definitized before work began, and was allowed to be used for charitable contributions. NSF agrees that initial releases of fee were proposed by the awardee as a percentage of cost pending finalization of the award. However, fee was set forth in the initial award as a specific dollar amount, and the final fee was definitized based on specific dollar amounts for each category of fee use in accordance with agency policy. Providing initial increments of fee to allow work to proceed under the project had no negative impact on the fee amount. Fee does not vary based on incurred cost and is only subject to re-negotiation if the work effort (scope) under the award is re-negotiated and agreed to by both parties. An approved policy deviation was issued to allow fee to be used for charitable contributions. NSF determined the fee under the award to be reasonable, and to have denied Battelle, as a charitable trust organization, to receive a fee or to use it for charitable contributions, would have been unreasonable. Although the OIG states that the fee paid to the awardee is higher than fees under similar large facility awards, NSF considers the fee to be in line with fees paid to organizations completing similar projects under awards made by other Federal agencies. Not providing adequate fees to organizations consistent with fees generally paid by the government for the construction and operation of facilities will not encourage highly qualified organizations to compete for NSF awards. We also note that NSF will continue to provide guidance on inappropriate uses of fee under the award and will require fee use to be separately tracked.

The Draft Report infers that a thorough cost analysis was not completed. Costs proposed by Battelle for completion of both construction and initial operations were thoroughly reviewed by NSF in accordance with agency procedures for financial assistance awards. A CPRD was completed and documented the reasonableness of all categories of cost. Consistent with other estimates for large complex projects that include unique requirements, the amount of available information associated with each category of cost varied dependent on multiple factors, including the availability of historic information versus use of parametric or engineering estimates for supplies or services where such information was not available. However, NSF

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determined that all categories of costs were sufficiently estimated to establish a reasonable total cost for each award. Part of the NSF's Grants Officer's final determination of cost reasonableness for the construction award was also informed by an Independent Cost Estimate (ICE) contracted by NSF, which was reconciled as part of the cost analysis process and documented in the CPRD.

Finally, the Draft Report concludes that NSF does not have proper controls in place to monitor or evaluate key aspects of the award, including controls to properly monitor classification of costs associated with subcontract and consultant services, manage the use of contingency, or evaluate the financial viability of the awardee. To address these concerns, we first note that NSF has controls in place to monitor classification of costs including subcontract and consultant services. NSF continues to negotiate the indirect cost rates and monitor the costs that are burdened and non-burdened for Battelle Ecology Incorporated, which is where the classification concerns originated. Further, under strengthened NSF procedures, the awards are subject to incurred cost audits to ensure proper classification of costs. Contingency is also closely monitored. As noted by the OIG in the Draft Report, NSF determined that adequate internal controls were in place to minimize risk associated with providing the initial amount of contingency, which was necessary to permit Battelle to properly manage identified project risks pending definitization of costs. These controls included monthly reports covering all contingency use and the continued use of the Configuration Control Plan (which included NSF approval thresholds) of the predecessor organization pending finalization of an updated plan from Battelle. Related to the determination of the financial viability of the awardee, as acknowledged in the Draft Report, NSF determined to make an award decision using an alternate and expedited approach in consideration of the exigent circumstances and urgent need to select a new organization to complete the NEON project. The use of this alternate approach was documented by the agency. NSF relied heavily on the expertise of Battelle's cognizant audit agency, the Defense Contract Audit Agency, in determining that Battelle is a financially viable organization. As of the date of the award decision, Battelle was ranked 27th of the top 100 U.S. Federal Government contractors. It is now ranked 23rd based on the most current information available.

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Appendix B: Objectives, Scope, and Methodology

The objectives of this inspection were to (1) determine whether NSF is following its policies and procedures when awarding the Battelle construction and operations awards, (2) determine how NSF is implementing recent NSF OIG and National Academy of Public Administration recommendations during the Battelle award, and (3) determine whether NSF is adequately monitoring the Battelle award. We conducted this inspection from August 2016 to October 13, 2016, in accordance with the Quality Standards for Inspection and Evaluation, issued by the Council of Inspectors General on Integrity and Efficiency.

Appendix C: OIG Contact and Staff Acknowledgments

OIG Contact:

Elizabeth Goebels, Director, Performance Audits, (703) 292-8483, egoebels@nsf.gov

Staff Acknowledgments:

In addition to the contact named above, Marie Maguire, Deputy Assistant Inspector General for Audits; Elizabeth Argeris, Communications Analyst; and Keith Nackerud, Independent Report Referencer, made key contributions to this report.

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