National Science Foundation • Office of Inspector General
4201 Wilson Boulevard, Suite I-1135, Arlington, Virginia 22230

MEMORANDUM

Date: JUL 1 - 2014

To: Mary F. Santonastasso, Director
Director, Division of Institution and Award Support

Karen Tiplady, Director
Director, Division of Grants and Agreements

From: Dr. Brett M. Baker
Assistant Inspector General for Audit

Subject: Audit Report No. 14-1-002
Virginia Polytechnic Institute and State University

This memo transmits the WithumSmith+Brown (WSB) report for the audit of costs totaling $113 million charged by Virginia Polytechnic Institute and State University (Virginia Tech) to its sponsored agreements with NSF during the period January 1, 2010 and ending December 31, 2012. The audit objectives were to: (1) identify and report on instances of unallowable, unallocable, and unreasonable costs; (2) identify and report on instances of noncompliance with regulations, Federal financial assistance requirements, and the provisions of the NSF award agreements related to the transactions selected; and to (3) determine the reasonableness, accuracy and timeliness of the awardee's American Reinvestment and Recovery Act of 2009 (ARRA) quarterly reporting, including reporting the jobs created under ARRA and grant expenditures for the two most recent quarters.

The auditors determined that costs Virginia Tech charged to its NSF sponsored agreements did not always comply with applicable Federal requirements. The auditors questioned $1,604,129 of costs claimed on 109 NSF awards. Specifically, the auditors noted: $1,456,716 in senior personnel salary that exceeded NSF's two-month limit; [redacted] in indirect cost overcharges; $8,485 in unallowable moving expenses; $2,913 in unallocable immigration fees; $2,101 in unreasonable travel expenses; and $118,329 in unreasonable equipment and materials charges. These questioned costs resulted in five areas identified where Virginia Tech's controls could be improved to ensure compliance with laws and regulations.

The auditors also found that Virginia Tech properly accounted for and segregated NSF ARRA funded awards in its accounting system. Additionally, Virginia Tech's ARRA reports were reasonable, accurate, and timely. For the quarters ending September 30, 2012 and December 31, 2012, expenditures and jobs creation were verified without exception. However, the auditors found that $298,412 in unallowable costs (of the $1,604,129 in total questioned costs) were charged to ARRA awards.

The auditors recommended that NSF address the findings by requiring Virginia Tech to work with NSF in resolving the questioned costs of $1,604,129 and strengthen Virginia Tech's administrative and management controls.

Virginia Tech, in its response dated May 27, 2014, agreed with the majority of the findings and questioned costs. However, Virginia Tech responded that the institution does not believe NSF policies are clear concerning the charging of senior salary, but they are developing a new proposal management system, which will be designed to capture the data necessary to assure compliance with the NSF Senior Project Personnel rule, once it is clarified by NSF. Virginia Tech also added two positions to its Office of Sponsored Programs' Compliance Team. Virginia Tech's response is described after the findings and recommendations and is included in its entirety in Appendix A.

Appendix C contains a detailed summary of the unallowable items that were questioned. Additional information concerning the questioned items was provided separately by OIG to the Division of Institution and Award Support, Cost Analysis and Audit Resolution Branch. Please coordinate with our office during the six month resolution period, as specified by OMB Circular A-50, to develop a mutually agreeable resolution of the audit findings. Also, the findings should not be closed until NSF determines that all recommendations have been adequately addressed and the proposed corrective actions have been satisfactorily implemented.

<u>OIG Oversight of Audit</u>

To fulfill our responsibilities under generally accepted government auditing standards, the Office of Inspector General:

- Reviewed WSB's approach and planning of the audit;
- Evaluated the qualifications and independence of the auditors;
- Monitored the progress of the audit at key points;
- Coordinated periodic meetings with WSB and NSF officials, as necessary, to discuss audit progress, findings, and recommendations;
- Reviewed the audit report, prepared by WSB to ensure compliance with generally accepted government auditing standards; and
- Coordinated issuance of the audit report.

WSB is responsible for the attached auditor's report on Virginia Tech and the conclusions expressed in the report. We do not express any opinion on the conclusions presented in WSB's audit report.

We thank your staff for the assistance that was extended to our auditors during this audit. If you have any questions regarding this report, please contact Elizabeth Goebels at [redacted] or Billy McCain at [redacted]

Attachment

cc: Alex Wynnyk, Branch Chief, CAAR
Michael Van Woert, Executive Officer, NSB
Ann Bushmiller, Senior Legal Counsel, NSB

Virginia Polytechnic Institute and State University

Audit of Incurred Costs for
National Science Foundation Awards
For the Period January 1, 2010 to December 31, 2012

TABLE OF CONTENTS

ACRONYMS

AAG	Award & Administrative Guide
ARRA	American Reinvestment and Recovery Act of 2009
CFR	Code of Federal Regulation
CHEMS	Center for Energy Harvesting Materials and Systems
DIAS	Division of Institution and Award Support
F&A	Facilities and Administrative
FDP	Federal Demonstration Partnership
FFR	Federal Financial Report
GPG	Grant Policy Guide
IDC	Indirect Cost
IGERT	Integrative Graduate Education and Research Traineeship
IPA	Intergovernmental Personnel Act
MTDC	Modified Total Direct Costs
NSF	National Science Foundation
OIG	Office of Inspector General
OMB	Office of Management and Budget
OSP	Office of Sponsored Projects
PI	Principal Investigator
REU	Research Experience for Undergraduates
Virginia Tech	Virginia Polytechnic Institute and State University

WithumSmith+Brown
A Professional Corporation
Certified Public Accountants and Consultants

8403 Colesville Road, Suite 340
Silver Spring, Maryland 20910 USA
301.585.7990 . fax 301.585.7975

www.withum.com
Additional Offices in New Jersey
New York and Pennsylvania

Independent Auditors' Report

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950 (P.L. 810-507). Its mission is "to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense." The Foundation is also committed to ensuring an adequate supply of the Nation's scientists, engineers, and science educators. NSF funds research and education in science and engineering by awarding grants and contracts to educational and research institutions in all parts of the United States. Through grants, cooperative agreements, and contracts, NSF enters into relationships with non-Federal organizations to fund research education initiatives and assist in supporting internal program operations. Virginia Polytechnic Institute and State University (Virginia Tech) is an NSF grant recipient.

Virginia Tech is a public land-grant university serving the Commonwealth of Virginia, the nation, and the world community. The discovery and dissemination of new knowledge are central to its mission. Through its focus on teaching and learning, research and discovery, and outreach and engagement, the university creates, conveys, and applies knowledge to expand personal growth and opportunity, advance social and community development, foster economic competitiveness, and improve the quality of life.

The University generated $454 million for research programs in fiscal year 2012, ranking 40th in the nation, according to the National Science Foundation. Each year, the university receives thousands of awards to conduct research from an ever-expanding base of sponsors. Because Virginia Tech is one of the largest recipients of NSF award dollars, NSF-OIG selected the University for audit.

WithumSmith+Brown, under contract with the NSF-OIG, audited the costs claimed by Virginia Tech to NSF for the period beginning January 1, 2010 and ending December 31, 2012. Our audit objectives were to: (1) identify and report on instances of unallowable, unallocable, and unreasonable costs; (2) identify and report on instances of noncompliance with regulations, Federal financial assistance requirements, and the provisions of the NSF award agreements related to the transactions selected; and to (3) determine the reasonableness, accuracy and timeliness of the awardee's American Reinvestment and Recovery Act of 2009 (ARRA) quarterly reporting, including reporting the jobs created under ARRA and grant expenditures for the two most recent quarters.

We conducted this performance audit in accordance with generally accepted government auditing standards which require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Our objectives, scope, methodology, and criteria are more fully detailed in Appendix B.

Results in Brief

To aid in determining reasonableness, allowability, and allocability of costs, we obtained from NSF all awards for which costs were reported to NSF during the period of January 1, 2010, through December 31, 2012. This provided an audit universe of approximately $113 million, in more than 190,000 transactions, across 685 individual NSF awards.

Of the $113 million in the universe, our audit questioned $1,604,129 of costs claimed on 109 NSF awards because Virginia Tech did not comply with Federal and NSF award requirements. Specifically, we noted: $1,456,716 in senior personnel salary that exceeded NSF's two-month limit; $15,585 in indirect cost overcharges; $8,485 in unallowable moving expenses; $2,913 in unallocable immigration fees; $2,101 in unreasonable travel expenses; and $118,329 in unreasonable equipment and materials charges. These questioned costs resulted in five areas identified where Virginia Tech's controls could be improved to ensure compliance with laws and regulations.

The universe of NSF ARRA-funded awards included approximately $17 million, in more than 25,000 transactions, across 47 NSF awards. Our review found that Virginia Tech properly accounted for and segregated NSF ARRA-funded awards in the accounting system. Additionally, the ARRA reports were reasonable, accurate, and timely. For the quarters ending September 30, 2012 and December 31, 2012, expenditures and jobs creation were verified without exception. The allowability of costs reported for these awards were tested in conjunction with the other NSF awards. We did note $298,412 questioned in 15 ARRA awards with expenditures related to senior personnel that exceeded the two-month NSF salary limit.

Virginia Tech reviewed and agreed with the facts via email and their written response for $1,520,854 in questioned costs: 1) $1,456,716 for exceeding NSF limits on senior salary; 2) $15,585 for the improper allocation of indirect costs; 3) $8,485 for moving and relocation expenses; 4) $2,913 for unallowable immigration fees; 5) $2,101 for unreasonable travel expenses; and 6) $35,054 for unreasonable property purchases. Of the amounts in question, the University stated that adjustments have already been made to correct $27,457. The University did not agree with $83,275 of equipment and materials purchases that were not allocable, reasonable, or prudent. The findings are outlined in our report and presented by award in Appendix C.

Findings and Recommendations

Finding 1 – Exceeded NSF Limits on Senior Salary

Our review of the accounting and reporting of NSF senior salary costs revealed that Virginia Tech does not adequately track/monitor senior personnel costs. For example, our review identified senior personnel whose salary appeared to exceed the NSF two-month salary limit.

Per NSF grant terms and conditions, grantees are fully responsible for the adherence to NSF policies. One such condition relates to senior personnel. Per NSF Award & Administrative Guide (AAG), Chapter V, Allowability of Cost, Section 1, Salaries, Wages, and Fringe Benefits, "NSF normally limits salary compensation for senior project personnel on awards made by the Foundation, to no more than two months of their regular salary in any one year. This limit includes salary received from all NSF funded grants…any ***compensation for such personnel in excess of two months must be disclosed in the proposal budget, justified in the budget justification, and must be specifically approved by NSF in the award notice***."

Using data analytics, we extracted employees appearing to exceed the two-month NSF senior salary limitation. We provided the list of potential salary overcharges to Virginia Tech for review. Virginia Tech's Office of Sponsored Projects (OSP) and the Controller's Office identified and excluded employees: 1) exempt from the two-month limit because they were Intergovernmental Personnel Act assignments (IPAs) representing employees detailed to the Foundation and remaining on Virginia Tech's payroll while assigned to NSF; and 2) not senior personnel per the award documentation. Virginia Tech also reviewed and corrected the salary rates as necessary. After completing their review, Virginia Tech provided a final list of individuals exceeding the two-month limit totaling $792,273, excluding applicable fringe benefits and overhead (see Appendix C for detail by award).

Salary	Fringe Benefit	Overhead	Total Questioned
$ 792,273	$[redacted]	[redacted]	$ 1,456,716

These overcharges were due to a lack of effective monitoring. As a result, $1,456,716 in salary, fringe benefits and overhead on 95 NSF awards is questioned. Had Virginia Tech effectively monitored their senior personnel salary costs, these overcharges would not have occurred. Without a process in place to ensure that the senior personnel do not exceed the NSF two-month criteria, there is the increased risk that funds may not be spent in accordance with NSF requirements.

Virginia Tech's administrative and management controls were not adequately designed to facilitate monitoring of senior personnel salary limits which resulted in unallowable costs.

Recommendation 1:

We recommend that the NSF's Director of the Division of Institution and Award Support (DIAS) address and resolve the following Virginia Tech recommendations:

a. Work with NSF to resolve the $1,456,716 of questioned costs; and
b. Strengthen the administrative and management controls and processes for senior personnel to ensure NSF salary limits are not exceeded.

Awardee Comments:

Per Virginia Tech, the applicability of the NSF Senior Project Personnel rule for certain classes of faculty is unclear. First, Virginia Tech believes a Principal Investigator (PI) in a position fully or partly based on the availability of external funding beyond 2 months per year is exempt from the rule. Their understanding is that this exception to the rule is blanket in nature and approval on individual awards is not required. Second, the Virginia Tech faculty handbook states [redacted] Third, it is unclear how NSF rules for the two-month NSF senior salary limitation intersect with the decentralized re-budgeting authority granted the NSF AAG. Finally, the majority of the academic salary costs questioned in each award/year ([redacted]% totaling $247,942) exceed the two-month NSF senior salary limitation by less than $5,000, or less than roughly one semimonthly pay period. (See Appendix A for the complete awardee response.)

Auditor Comments:

A specific example NSF's objection to a PI exceeding the two-month rule occurred for award [redacted] that had to be amended before being awarded. Per the program officer, the PI requested more than two-months but "NSF only allows 2.0 months per year from all NSF awards". As a result, revised budget was submitted limiting the salary to two-months in the first year. Despite this revision, the costs were exceeded in the first year by $12k for this award and $10k for award [redacted] or a combined 3 months.

Per the NSF Grant Proposal Guide (GPG), NSF regards research as one of the normal functions of faculty members at institutions of higher education. The NSF definition of Senior Personnel does not contain a distinction between "regular" or "restricted" faculty. Individuals other than the PIs considered to be faculty members, and who will participate in the project being supported, are Senior Personnel. Additionally, the rule does provide for compensation in excess of two-months. NSF requires it be disclosed in the proposal budget, justified in the budget justification, and approved by NSF in the award notice. Therefore, the report finding remains as previously stated.

Finding 2 – Improper Allocation of Indirect Costs

Virginia Tech claimed excess indirect costs (IDC) of $15,585 to one NSF award. The overcharge occurred because Virginia Tech failed to exclude rent and tuition costs from the indirect cost base before the indirect costs were charged to the award.

2 CFR §220 (OMB Circular A-21), Appendix A to Part 220 - *Principles for Determining Costs Applicable to Grants Contracts, and Other Agreements with Educational Institutions*, Section G.2 states: "The distribution basis. Facilities and Administrative (F&A) Costs shall be distributed to applicable sponsored agreements and other benefiting activities within each major function (see Section 8.1) on the basis of modified total direct costs, consisting of all salaries and wages, fringe benefits, materials and supplies, services, travel, and subgrants and subcontracts up to the first $25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Equipment, capital expenditures, charges for patient care and tuition remission, rental costs, scholarships, and fellowships, as well as the portion of each subgrant and subcontract in excess of $25,000, shall be excluded from modified total direct costs."

Virginia Tech's system [redacted]. [redacted]. In this instance, the staff recalculation did not exclude the rental costs and scholarships as required by 2 CFR 220 resulting in an overcharge to NSF. Virginia Tech's OSP recalculated the IDC and identified the error when providing documentation for audit. Virginia Tech is awaiting guidance from NSF to remove the excess indirect costs from the award in question.

Without a process in place to ensure that the employees are properly trained and manual adjustments are adequately reviewed, there is the increased risk that Virginia Tech may incorrectly assign IDC's to NSF awards. Virginia Tech did not adequately train the employee and review the manual IDC calculation which resulted in grant accounting errors.

Recommendation 2:

We recommend that the NSF's Director of the DIAS address and resolve the following Virginia Tech recommendations:

a. Work with NSF to resolve the $15,585 of questioned costs; and
b. Strengthen the administrative and management controls and processes for recalculating indirect costs charged to NSF awards to ensure that only allowable cost categories are included in the IDC calculation.

Awardee Comments:

Virginia Tech concurs with this finding and recommendation and will continue to provide regular training for departmental fiscal staff and central administrators in these areas. Virginia Tech's systems of control are designed to be effective and efficient, providing reasonable but not absolute assurance of compliance. We believe this to be isolated error that was overlooked by both the originator and the reviewer. Because the award has closed, Virginia Tech will seek guidance from NSF on how to return the excess indirect cost funds. (See Appendix A for the complete awardee response.)

Auditor Comments:

Virginia Tech's comments are responsive to the issue noted in this finding. Once NSF determines that the recommendation has been adequately addressed and the questioned costs have been resolved, this finding should be closed.

<u>Finding 3 – No Benefit for Moving and Relocation Expenses</u>

We noted $8,485 in unallowable and unreasonable moving and relocation expenses related to four NSF awards. These costs were due to employees who did not work on the award for at least 12 months after hire as required by 2 CFR 220 and moving expenses for spouses of employees who did not meet the requirements in NSF Grant General Conditions Section 10. As such, there was no benefit to the awards, and the costs are questioned.

Per Section 42(a) 2 CFR §220 (OMB Circular A-21), "...relocation costs incurred incident to recruitment of new employees, are allowable to the extent that such costs are incurred pursuant to a well-managed recruitment program...where…the newly hired employee resigns for reasons within his control within 12 months after hire, the institution will be required to refund or credit such relocation costs to the Federal Government."

Additionally, the NSF Grant General Conditions Section 10, Travel, state that travel support for dependents of key project personnel is allowable only if the individual is a key person who is essential to the project on a full-time basis; the individual's residence away from home and in a foreign country is for a continuous period of six months or more and is essential to the effective performance of the project; and the dependents' travel allowance is consistent with the policies of the organization administering the award.

Without a process in place to ensure the proper charging of moving expenditures, there is the increased risk that funds may not be spent in accordance with Federal requirements. Virginia Tech personnel did not adequately monitor the moving and relocation expenditures charged to NSF awards which resulted in unallowable costs. Virginia Tech has performed corrective actions to remove the excess moving and relocation costs from the awards in question.

Recommendation 3:

We recommend that the NSF's Director of the DIAS address and resolve the following Virginia Tech recommendations:

a. Work with NSF to resolve the $8,485 of questioned costs; and
b. Strengthen the administrative and management controls and processes for reviewing the propriety of moving and relocation expenses charged to NSF awards.

Awardee Comments:

Virginia Tech concurs with this finding and recommendation and will continue to provide regular training for departmental fiscal staff and central administrators in these areas. Virginia Tech's systems of control are designed to be effective and efficient, providing reasonable but not absolute assurance of compliance. We believe this to be isolated error that was overlooked by both the originator and the reviewer. The costs have been removed and revenue returned by letter of credit. (See Appendix A for the complete awardee response.)

Auditor Comments:

Virginia Tech's comments are responsive to the issue noted in this finding. Once NSF determines that the recommendation has been adequately addressed and the questioned costs have been returned, this finding should be closed.

<u>*Finding 4 – Unallocable Immigration Fees*</u>

We noted $2,913 in unallowable visa immigration fees for two NSF awards. For one of these awards, one employee only worked 60 percent on the award. There was no benefit to the award for 40 percent of the costs for this employee. For another award, the employee subsequently declined the position offered. Therefore, the costs are questioned.

Section C.4 of 2 CFR §220 (OMB Circular A-21) "…cost is allocable to a sponsored agreement if it is incurred solely to advance the work under the sponsored agreement…."

Virginia Tech personnel did not adequately review the expenditures charged to NSF awards which resulted in unallowable costs. Virginia Tech has performed corrective actions to remove the excess visa fees from the awards in question. Without a process in place to ensure the proper monitoring of visa fees charged, there is the increased risk that funds may not be spent in accordance with Federal requirements.

Recommendation 4:

We recommend that the NSF's Director of the DIAS address and resolve the following Virginia Tech recommendations:

a. Work with NSF to resolve the $2,913 of questioned costs; and
b. Strengthen the administrative and management controls and processes for reviewing and approving visa fees charged to NSF awards.

Awardee Comments:

Virginia Tech concurs with this finding and recommendation and will continue to provide regular training for departmental fiscal staff and central administrators in these areas. Virginia Tech's systems of control are designed to be effective and efficient, providing reasonable but not absolute assurance of compliance. We believe this to be isolated error that was overlooked by both the originator and the reviewer. The costs have been removed and revenue returned by letter of credit. (See Appendix A for the complete awardee response.)

Auditor Comments:

Virginia Tech's comments are responsive to the issue noted in this finding. Once NSF determines that the recommendation has been adequately addressed and the questioned costs have been returned, this finding should be closed.

<u>Finding 5 – Unreasonable Travel Expenses</u>

We questioned $2,101 in unreasonable travel expenses related to three NSF awards including illegible meal receipts ($48), alcohol charges ($70), nine days of a fourteen-day Australia trip ($1,627), no show/cancellation fees ($299), and for a workshop hotel room rate exceeding others ($57).

Section C.4 of 2 CFR §220 (OMB Circular A-21) "…cost is allocable to a sponsored agreement if it is incurred solely to advance the work under the sponsored agreement; it benefits both the sponsored agreement and other work of the institution, in proportions that can be approximated through use of reasonable methods…The recipient institution is responsible for ensuring that costs charged to a sponsored agreement are allowable, allocable, and reasonable under these cost principles." Section A states that "the accounting practices of individual colleges and universities must support the accumulation of costs as required by the principles, and must provide for adequate documentation to support costs charged to sponsored agreements." Additionally, per section J.3, the costs of alcoholic beverages are unallowable.

We found that meals and lodging expenditures for nine days of the fourteen-day trip to Australia were not allocable because portions of the trip did not benefit the award. The student took a fourteen-day trip to Australia with a family member and spent a total of 5 days on grant-related activities. Per Virginia Tech, the PhD student was a participant in their Integrative Graduate Education and Research Traineeship (IGERT) Fellows program. During the five days, the Fellow visited a group at a university that helped with her research one afternoon and then attended the four-day conference. No explanation was given as to how the additional nine days in Australia with a family member, when not spent attending the workshop or conference, benefited the award.

Virginia Tech has performed corrective actions to remove $474 in travel costs from the awards in question; leaving only the $1,627 for the Australia trip which remains unresolved.

Recommendation 5:

We recommend that the NSF's Director of the DIAS address and resolve the following Virginia Tech recommendations:

a. Work with NSF to resolve the $474 of questioned costs;
b. Work with NSF to resolve to NSF the $1,627 of questioned costs; and

c. Strengthen the administrative and management controls and processes for reviewing and approving travel expenses charged to NSF awards.

Awardee Comments:

Virginia Tech concurs with this finding and recommendation and will continue to provide regular training for departmental fiscal staff and central administrators in these areas. Virginia Tech's systems of control are designed to be effective and efficient, providing reasonable but not absolute assurance of compliance. We believe this to be isolated error that was overlooked by both the originator and the reviewer. Virginia Tech has removed and returned $474 of these costs and will seek guidance from NSF on how to return the remaining funds. (See Appendix A for the complete awardee response.)

Auditor Comments:

Virginia Tech's comments are responsive to the issue noted in this finding. Once NSF determines that the recommendation has been adequately addressed and the questioned costs have been returned, this finding should be closed.

<u>Finding 6 – Unreasonable Equipment and Property Charges</u>

We found that equipment expenses totaling $118,329 charged to nine NSF awards were not either allocable, necessary or reasonable in accordance with 2 CFR 220 – Cost Principles for Educational Institutions (formerly OMB Circular A-21).

According to 2 CFR 220, Section C, to be allowable for a federal grant, a cost must be allocable to the federal award and be necessary and reasonable for the administration and performance of the award. Furthermore, Appendix A, Sections C.2 and C.3, state that a cost must be reasonable to be allowable and provide that a reasonable cost is one that a "prudent person" would have incurred under similar circumstances.

With such a significant portion of the approved funding allocated to unbudgeted equipment purchases, we question whether Virginia Tech could accomplish the research project as approved by NSF, thus potentially changing the scope of the funded research. Several criteria, including 2 CFR, Part 215, Section 215.25(c)(1); the matrix of prior approval requirements for Federal Demonstration Partnership (FDP) member institutions; and NSF's Award and Administration Guide, Chapter II, Section B.1.a, require prior approval for changes in the scope of a sponsored project. We found no evidence that Virginia Tech assessed the impact the reduction to the approved budget categories had on the scope, requested, or received NSF approval for the potential change in scope of the project.

We questioned equipment and property totaling $80,638 because the purchase of this equipment was not included in the original grant application and not allocable, reasonable or prudent. Specifically, because these purchases represent a significant reduction in the funds necessary to complete the proposed research tasks, we question whether a prudent person would have spent more than 20 to 25 percent of the total funding approved for the project on additional equipment.

- Per the grant proposal, equipment costing [redacted] was to be donated to Virginia Tech by an outside party. When the donation did not materialize, the equipment was purchased with grant funds. This equipment purchase represented 25 percent of the total funds awarded by NSF. Without obtaining NSF approval, Virginia Tech then reallocated the available budget by reducing the salaries on the project, potentially changing the scope of the project.

Virginia Tech officials stated the salary shortfall was made up through uncommitted cost share. However, NSF regards research as one of the normal functions of faculty members at institutions of higher education, and compensation for time normally spent on research within the term of appointment is deemed to be included within the faculty member's regular organizational salary. Additionally, we were unable to determine the amount of uncommitted cost share expended on this award. Therefore, the equipment costing [redacted] is questioned.

- Virginia Tech reallocated $18,711 intended for salaries, fringe benefits, publication, travel, and required evaluation costs to purchase equipment, which represented [redacted] of the award budget, potentially changing the scope of the project. The award was meant to provide a small investment from NSF to assist the Center for Energy Harvesting Materials and Systems (CEHMS) develop long-term partnerships among industry, academe, and government, and the primary budget item was salaries. Virginia Tech officials stated this purchase was necessary and the program could not be conducted without the equipment, but the NSF approved budget was meant to fund the development of partnerships, not to purchase equipment. We question the reasonableness of reallocating such a large percentage of the award budget and therefore question the $18,711 of equipment purchased.

- Thirteen iPads, iPad covers, and a power sync cart were not necessary for the operation of the award. The original budget justification included iMac desktop computers for software development and 2 iPads and 2 iPods for internal app development testing. Per Virginia Tech, the additional equipment was acquired to expand the program to additional participants, however, per the documentation provided, they were purchased for use by the institutional technology resource teacher, other participating teachers, Co-PI's and PI's. Therefore, the purchase costing [redacted] is questioned.

We questioned a total of $37,691 for several purchases of equipment near the award expiration that did not appear to benefit the award or that did not appear necessary for the administration of the award. In many cases, the purchases appeared to be an attempt to use the remaining award funds prior to expiration. In some cases, the purchase appears to be general purpose computers not primarily or exclusively used in the actual conduct of the proposed research.

- [redacted] for a desktop computer purchased on July 2, 2010 on a five-year award that expired February 28, 2011.

- [redacted] for a TV, three X-Boxes with Microsoft Kinect game bundles, two laptops, and a monitor. Items with an invoice date of March 1, 2012 on a six-year award that expired February 29, 2012.

- [redacted] for a weather station purchased on February 26, 2010 on a three-year award that expired April 30, 2010. Per the NSF Program Officer (PO), they would not have approved the expenditure because the primary goal of the Research Experience for Undergraduates (REU) site program is to provide students with research experience and not to fund equipment.

- [redacted] for an outdoor enclosure rack on August 16, 2012 on a four-year award that expired August 31, 2012.

- [redacted] for the purchase of a universal software radio peripheral purchased on September 30, 2011 on a two-year award that expired September 30, 2011.

- $[redacted] for purchases on a three-year award that expired August 31, 2012.

- [redacted] for the purchase of eight iPad III tablets on May 11, 2012.
- [redacted] for the purchase of iPad covers on May 12, 2012.
- [redacted] for the purchase of an LCD display purchased on May 22, 2012.
- [redacted] for the purchase of a laptop battery purchased on June 12, 2012.

Recommendation 6:

We recommend that the NSF's Director of the DIAS address and resolve the following Virginia Tech recommendations:

a. Work with NSF to resolve the $118,329 of questioned costs.

Awardee Comments:

Virginia Tech does not concur with the first four items totaling $83,275 because, Virginia Tech holds that: 1) its actions were appropriate, reasonable, within Virginia Tech's re-budgeting authority and necessary to complete the project as originally proposed; 2) the industrial focus area of solar systems technologies is within the overall mission of CEHMS, and a reasonable evolution of the scope; 3) teachers would have been highly reluctant to reserve instructional time and the enthusiasm would have been severely dampened were they not to have access to an iPad that they could configure for their instructional needs; and 4) the NSF approved proposal budget justification included the purchase of two state of the art desktop personal computers; therefore, the computer purchase was appropriate, reasonable, and necessary to complete the project during the 229 days remaining in the period of performance.

Virginia Tech concurred with the last five items totaling $35,054 and will continue ongoing communication to the campus community regarding equipment purchases nearing the end of the project period and funding intent. (See Appendix A for the complete awardee response.)

Auditor Comments:

We believe the purchases of the first three items, not included in the original grant applications, were not allocable, reasonable or prudent. Virginia Tech 1) should have used University funds to purchase the equipment since covering the PIs salary was always their responsibility; 2) the budget was meant to fund the meetings, not equipment; and 3) the budget included the purchase of equipment for development and testing. For the fourth item, the [redacted] for two desktops was meant for year 1. It is not clear how this purchase of general purpose equipment in the last six months of a six year award was primarily or exclusively used in the actual conduct of the scientific research when 86 percent of the award period had already lapsed. Therefore, the report finding remains as previously stated.

Virginia Tech's comments on the last five items are responsive to the issues noted in this finding. Once NSF determines that the $35,054 in questioned costs have been returned, these issues should be closed.

WithumSmith+Brown, PC

WithumSmith+Brown PC
June 30, 2014

APPENDICES

AWARDEE RESPONSE

VirginiaTech

University Controller (MC 0312)
North End Center, Suite 3300, Virginia Tech
300 Turner Street NW
Blacksburg, Virginia 24061
540-231-6418 Fax: 540-231-7221
www.co.vt.edu

May 27, 2014

WithumSmith+Brown PC
8403 Colesville Road, Suite 340
Silver Spring, MD 20910

TO WHOM IT MAY CONCERN:

Thank you for the opportunity to review and comment on the National Science Foundation (NSF) draft audit report titled, "Virginia Tech, Audit of Incurred Costs for National Science Foundation Awards for the Period January 1, 2010 to December 31, 2012". Below you will find Virginia Tech's response to each finding. In response to the observations below with which we concur and in keeping with our continuous improvement plan, two positions have been added to the Office of Sponsored Programs' (OSP) Compliance Team. These positions will engage in continuous monitoring of key compliance areas. In addition, a new proposal management system is under development which will be designed to capture the data necessary to assure compliance with the NSF Senior Project Personnel rule, once the rule is clarified during the audit resolution process. For findings two through five, the university believes the low number of errors observed, relative to the large number of transactions reviewed, is an indication of a generally effective system of compliance and control.

Finding 1 – Exceeded NSF Limits on Senior Salary

Of the $1,456,716 senior salary questioned, [redacted] is associated with restricted positions fully dependent on available research funding or Calendar Year Research employees who are expected to generate a significant portion of their funding through sponsored projects. These two groups, representing a diminutive number of employees in the list of potential salary overcharges (ten), generally have little to no base university budget to support their salary. Per the NSF Grant Proposal Guide, II.C.2i(a), "NSF regards research as one of the normal functions of faculty members at institutions of higher education. Compensation for time normally spent on research within the term of appointment is deemed to be included within the faculty member's regular organizational salary."

The applicability of the NSF Senior Project Personnel rule for certain classes of faculty is unclear. Virginia Tech understands that the eligibility to charge more than 2 months salary for NSF Senior Project Personnel is entirely dependent on the nature of the PI's position. Virginia Tech holds that a PI in a position that is fully or partly based on the availability of external funding beyond 2 months per year is exempt from the rule. The status of the PI under this rule is based upon the nature of their position at the time an award is granted. Our understanding is that this exception to the rule is blanket in nature and approval on individual awards is not required.

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

AWARDEE RESPONSE

As faculty members prepare the proposal, attention is focused on the scope of work and available qualified personnel. To best represent Virginia's Tech talent, biographical sketches are uploaded for named personnel. By focusing on this, faculty may overlook that biographical sketches are only required for individuals identified as senior project personnel. These individuals are subject matter experts and thought of as field experts. However, Virginia Tech considers most research faculty appointments as restricted personnel. Per the faculty handbook, chapter six, "Research faculty appointments are designated to promote and expedite university research activities. Tenure cannot be earned in any of the research faculty ranks. Sponsored funding is seldom certain and never permanent. As a result, research-focused positions are usually appointed as "restricted" faculty members whose employment depends on availability of funding, the need for services, and satisfactory performance." Although these personnel are labeled as "Senior," they do not meet the definition of "regular" faculty as defined by NSF.

In addition, it is unclear how NSF rules for the two-month NSF senior salary limitation intersect with the decentralized re-budgeting authority granted in Section C.1 of the NSF Award and Administration Guidelines (Part II of the Proposal and Award Policies and Procedures Guide). The re-budgeting rules were designed to reduce the administrative burden on both NSF personnel and university faculty. The majority of the academic salary costs questioned in each award/year [redacted] totaling $247,942) exceed the two-month NSF senior salary limitation by less than $5,000, or less than roughly one semimonthly pay period.

Finding 2 – Improper Allocation of Indirect Costs
Finding 3 – No Benefit for Moving and Relocation Expenses
Finding 4 – Unallocable Immigration Fees
Finding 5 – Unreasonable Travel Expenses

Virginia Tech's systems of control are designed to be effective and efficient, providing reasonable but not absolute assurance of compliance. Virginia Tech concurs with these four findings and recommendations and will continue to provide regular training for departmental fiscal staff and central administrators in these areas. We believe these to be isolated errors in four very different areas that were overlooked by both the originator and the reviewer. Virginia Tech will seek guidance from NSF on how to return the excess indirect cost funds relative to finding two. As the costs relative to findings three and four have already been removed and revenue returned by letter of credit, we believe no further financial resolution is required. For finding five, Virginia Tech has removed and returned $474 of these costs and will seek guidance on returning the remaining $1,627.

Finding 6 – Unreasonable Equipment and Property Charges

Virginia Tech understands that the audit sample was comprised primarily of equipment purchases that occurred during the last 20 percent of the award period. While this is a widely-accepted audit technique and one that is employed by the university in its internal reviews, it is not necessarily indicative of a problem. The university believes that there are often valid programmatic needs for equipment purchases late in an award period and each purchase must be evaluated based on the particular facts and circumstances. Explanations for some of the findings with which we do not concur follow:

AWARDEE RESPONSE

- 0928807 - When the donation of equipment did not materialize, it was incumbent upon Virginia Tech to re-budget in a manner that ensured completion of the original scope of work. [redacted] In addition, some research effort on this project was voluntarily charged to internal sources of funding in order to achieve project objectives despite the setback. Effort reports were provided to the auditors to reflect research effort that was not charged to the project. Virginia Tech holds that these actions were appropriate, reasonable, within our re-budgeting authority, and necessary to complete the project as originally proposed.

- 1035042 - The budget to NSF was proposed in Year 2010; however the research seed project on the flexible DSSC solar cells was funded much later. Research in Industry University Cooperative Research Centers (I/UCRC) is a very dynamic process and changes with each Industry Advisory Board (IAB) meeting held semiannually. Projects are planned and approved by the IAB member companies through a collective voting process. NSF does not participate in the voting process. Also, the allocation of funds towards the seed projects is done by the IAB members and not by NSF. IAB looks at all the available funds in the center (membership fee and NSF contribution) and decides on how to invest it in the research and equipment's proportional to votes received during the voting process. The center director and faculty most of the time follow the recommendations of the IAB and implement their decisions. Since the flexible DSSC solar cell research project was not included in the original proposal and was proposed and funded by IAB at a later date, this equipment was not present in the original budget. Although an additional industrial focus area of solar systems technologies was identified as a priority by the IAB, it remains within the overall mission of Center for Energy Harvesting Materials and Systems (CEHMS), and a reasonable evolution of the scope. CEHMS is a permanent, officially recognized center of the university, which is the desired outcome for a well-run I/UCRC.

- 1118571 - The 13 iPads in question represent only an [redacted] ncrease in the 150 iPads estimated in the original proposal. The cost of the additional iPads was within the original project budget for equipment purchases and significantly enhanced the project outcome. The additional iPads, which were distributed to Co-PIs and participating teachers ensured the highest-quality design, development and testing of apps as well as the broadest, least-problematic diffusion and adoption of the deployed apps. The partnering school district made it clear after the award was received that they expected all participating teachers to have an iPad for their use to ensure feasible deployment. Teachers would have been highly reluctant to reserve instructional time for an app that they could not use to build lesson plans and other instructional supports or explore and understand during planning periods. In addition, the enthusiasm of participating teachers would have been severely dampened were they not to have access to an iPad that they could configure for their instructional needs. Unlike student iPads, the teacher iPads have unique access rights that allow for a much more fine-grained customization that ensures successful deployment of apps and execution of the research design.

- 0527252 – The NSF approved proposal budget justification included the purchase of two state of the art desktop personal computers with the associated software necessary to

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

complete the project activities. This computer was received 7/14/10 and in use until the end of the project on 2/28/11. Virginia Tech holds that the computer purchase was appropriate, reasonable, and necessary to complete the project during the 229 days remaining in the period of performance.

- 0551610 - Virginia Tech concurs with this recommendation and will continue ongoing communication to the campus community regarding equipment purchases nearing the end of the project period. Virginia Tech would like to document the dates regarding this purchase. On 8/1/11 [redacted] contacted William Bainbridge at NSF requesting permission to proceed with the purchase, which was approved. The purchase requisition process began on 12/19/11. Equipment was received between 1/23/12 and 2/24/12.

- 0649070 - Virginia Tech concurs with this recommendation and will strengthen its internal controls and provide regular training to the campus community regarding NSF's intent for Research Experiences for Undergraduate (REU) funding.

- 0812445 - Virginia Tech concurs with this recommendation and will continue to strengthen its compliance reviews in this area and enhance ongoing communication to the campus community regarding equipment purchases nearing the end of the project period.

- 0916873 - Virginia Tech concurs with this recommendation and will continue to strengthen its compliance reviews in this area and enhance ongoing communication to the campus community regarding equipment purchases nearing the end of the project period.

- 0954048 - Virginia Tech concurs with this recommendation and will continue to strengthen its compliance reviews in this area and enhance ongoing communication to the campus community regarding equipment purchases nearing the end of the project period.

Sincerely,

[redacted]

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

APPENDIX B

OBJECTIVES, SCOPE, AND METHODOLOGY

Our audit included assessing the allowability, allocability and reasonableness of costs claimed by Virginia Tech on the quarterly Federal Financial Reports (FFR) for the three-year period beginning January 1, 2010 through December 31, 2012. We also reviewed the accuracy, reasonableness, and timeliness of Virginia Tech's ARRA reporting.

The audit was performed in accordance with *Government Auditing Standards* for performance audits. The audit objectives were to:

1. Identify and report on instances of unallowable, unallocable, and unreasonable costs from the transactions tested;

2. Identify and report on instances of noncompliance with regulations, Federal financial assistance requirements (e.g. Office of Management and Budget Circulars), and the provisions of the NSF award agreements as relates to the transactions tested; and

3. Determine the reasonableness, accuracy, and timeliness of the awardee's ARRA quarterly reporting, including reporting of jobs created under ARRA and grant expenditures for the two most recent quarters.

To accomplish our objectives, we assessed the reasonableness, accuracy, and timeliness of the awardee's ARRA quarterly reporting, including reporting of jobs created under ARRA and grant expenditures for the two most recent quarters, by (1) recomputing the number of jobs created or retained in compliance with OMB Memorandum M-10-08, *Updated Guidance on the American Recovery and Reinvestment Act – Data Quality, Non-Reporting Recipients, and Reporting of Job Estimates*; (2) reconciled expenditures per the general ledger to the ARRA expenditures; and (3) reviewed the ARRA reporting submission dates.

To aid in determining reasonableness, allowability, and allocability of costs, we obtained from NSF all awards for which costs were reported to NSF during the period of January 1, 2010, through December 31, 2012. This provided an audit universe of approximately $113 million, in more than 190,000 transactions, across 685 individual NSF awards.

Our work required reliance on computer-processed data obtained from Virginia Tech and NSF. At our request, Virginia Tech provided detailed transaction data for all costs charged to NSF awards during our audit period. We obtained data directly from NSF which was collected by directly accessing NSF's various data systems. To select transactions for further review, we designed and performed automated tests of Virginia Tech and NSF data to identify areas of risk and conducted detailed reviews of transactions in those areas.

We assessed the reliability of the data provided by Virginia Tech by: (1) comparing costs charged to NSF award accounts within Virginia Tech's accounting records to reported net expenditures, as reflected in Virginia Tech's quarterly financial reports submitted to NSF for the corresponding periods; (2) performing general ledger to sub-ledger reconciliations of accounting data; and (3) reviewing and testing the parameters Virginia Tech used to extract transaction data from its accounting records and systems.

Based on our testing, we found Virginia Tech's computer-processed data sufficiently reliable for the purposes of this audit. We did not review or test whether the data contained in, or controls over, NSF's databases were accurate or reliable; however the independent auditors' report on NSF's financial statements for fiscal years 2010 and 2011 found no reportable instances in which NSF's financial management systems did not substantially comply with applicable requirements.

APPENDIX B

OBJECTIVES, SCOPE, AND METHODOLOGY

In assessing the allowability of costs reported to NSF by Virginia Tech, we also gained an understanding of the internal controls structure applicable to the scope of this audit through interviews with Virginia Tech staff, review of policies and procedures, and conducting walkthroughs as applicable and reviews.

We assessed Virginia Tech's compliance with the University's internal policies and procedures, as well as the following:

- Government Auditing Standards (2011 version);
- Public Law 111-5, *American Recovery and Reinvestment Act of 2009*;
- Office of Management and Budget (OMB) Circular A-21, *Cost Principles for Educational Institutions* (2 C.F.R., Part 220);
- OMB Circular A-110, *Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations* (2 C.F.R., Part 215);
- OMB Memorandum M-10-08, *Updated Guidance on the American Recovery and Reinvestment Act – Data Quality, Non-Reporting Recipients, and Reporting of Job Estimates*;
- NSF Proposal and Award Policies and Procedures Guide, Part II: Award and Administration Guide
- NSF Award Specific Terms and Conditions; and
- NSF Federal Demonstration Partnership Terms and Conditions.

The remaining attachments contain non-public material and are not posted.