

Performance Audit of Incurred Costs – Raytheon BBN Technologies

REPORT PREPARED BY COTTON & COMPANY LLP

NATIONAL SCIENCE FOUNDATION
OFFICE OF INSPECTOR GENERAL

September 14, 2017
OIG 17-1-007





AT A GLANCE

Performance Audit of Incurred Costs – Raytheon BBN Technologies

Report No. OIG 17-1-007

September 14, 2017

AUDIT OBJECTIVE

The National Science Foundation Office of Inspector General engaged Cotton & Company LLP (Cotton) to conduct a performance audit of incurred costs at Raytheon BBN Technologies (Raytheon BBN) for the period October 1, 2012, to September 30, 2015. The audit encompassed more than \$49 million comprising all costs claimed to NSF. The objective of the audit was to determine if costs claimed by Raytheon BBN during this period were allocable, allowable, reasonable, and in conformity with NSF award terms and conditions and applicable Federal financial assistance requirements. Cotton is responsible for the attached auditor's report and the conclusions expressed in this report. NSF OIG does not express any opinion on the conclusions presented in Cotton's audit report.

AUDIT RESULTS

Costs Raytheon BBN charged to its NSF-sponsored agreements did not always comply with Federal and NSF award requirements. The auditors questioned \$96,106 of costs claimed by Raytheon BBN during the audit period. Specifically, the auditors found Raytheon BBN did not ensure that all costs claimed by sub-awardees were allowable in accordance with the applicable cost principles and Federal regulations before it charged the expenses to NSF. As a result, Raytheon BBN claimed \$96,106 of unsupported or unallowable costs incurred by sub-awardees.

RECOMMENDATIONS

The auditors included one finding in the report with associated recommendations for NSF to resolve the questioned costs and to ensure Raytheon BBN strengthens administrative and management controls.

AUDITEE RESPONSE

Raytheon BBN reviewed the findings and agreed to repay NSF the entire \$96,106 of sub-awardee questioned costs. Raytheon BBN recognized the importance of having the right administrative and management oversight and proper controls in place to govern sub-awardees' spending. Raytheon BBN will continue to update and enhance its oversight and controls and take into consideration the recommendations contained in the report for future process improvements in order to help ensure that all costs are current, accurate, and complete. Raytheon BBN's response is attached in its entirety to the report as Appendix B.

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



MEMORANDUM

TO: Dale Bell
Director
Division of Institution and Award Support

Jamie French
Director
Division of Grants and Agreements

FROM: Mark Bell 
Assistant Inspector General
Office of Audits

DATE: September 14, 2017

SUBJECT: Audit Report No. 17-1-007, Raytheon BBN Technologies

This memo transmits the Cotton & Company LLP (Cotton) report for the audit of costs totaling approximately \$49 million charged by Raytheon BBN Technologies (Raytheon BBN) to its sponsored agreements with the National Science Foundation (NSF) during the period October 1, 2012, to September 30, 2015. The objective of the audit was to determine if costs claimed by Raytheon BBN during this period were allocable, allowable, reasonable, and in conformity with NSF award terms and conditions and applicable Federal financial assistance requirements.

In accordance with Office of Management and Budget Circular A-50, *Audit Followup*, please provide a written corrective action plan to address the report 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.

OIG Oversight of Audit

To fulfill our monitoring responsibilities, the Office of Inspector General:

- reviewed Cotton'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 Cotton, as necessary, to discuss audit progress, findings, and recommendations;
- reviewed the audit report prepared by Cotton to ensure compliance with generally accepted government auditing standards; and
- coordinated issuance of the audit report.



NATIONAL SCIENCE FOUNDATION OFFICE OF INSPECTOR GENERAL

We thank your staff for the assistance that was extended to the auditors during this audit. If you have any questions regarding this report, please contact Jeremy Hall at 703-292-7100.

Attachment

cc:

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RAYTHEON BBN TECHNOLOGIES

**PERFORMANCE AUDIT OF INCURRED COSTS FOR
NATIONAL SCIENCE FOUNDATION AWARDS
FOR THE PERIOD OCTOBER 1, 2012, TO SEPTEMBER 30, 2015**

**NATIONAL SCIENCE FOUNDATION
OFFICE OF INSPECTOR GENERAL**

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**NATIONAL SCIENCE FOUNDATION
PERFORMANCE AUDIT OF INCURRED COSTS
RAYTHEON BBN TECHNOLOGIES**

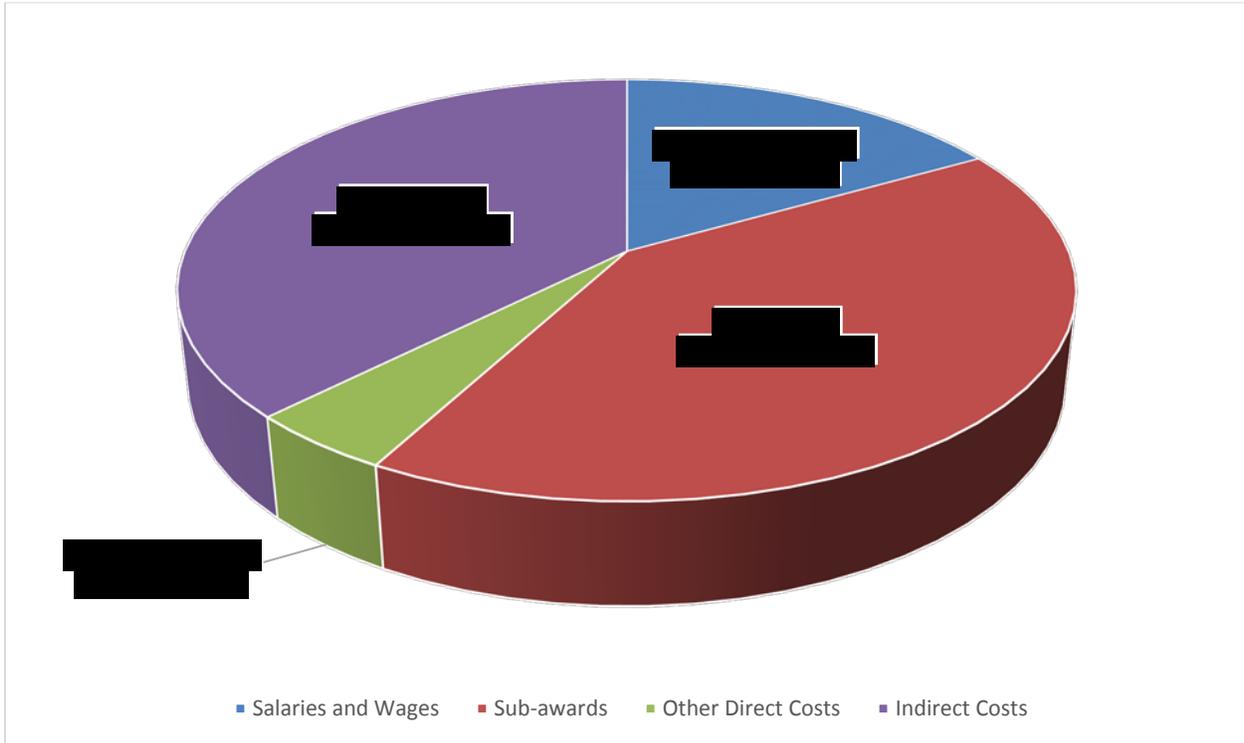
I. BACKGROUND

The National Science Foundation (NSF) is an independent Federal agency whose mission is to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense. Through grant awards, cooperative agreements, and contracts, NSF enters into relationships with non-Federal organizations to fund research and education initiatives and to assist in supporting its internal financial, administrative, and programmatic operations.

Most Federal agencies have an Office of Inspector General (OIG) that provides independent oversight of the agency's programs and operations. Part of NSF OIG's mission is to conduct audits and investigations to prevent and detect fraud, waste, and abuse. In support of this mission, NSF OIG may conduct independent and objective audits, investigations, and other reviews to promote the economy, efficiency, and effectiveness of NSF programs and operations, as well as to safeguard their integrity. NSF OIG may also hire a contractor to provide these audit services.

NSF OIG engaged Cotton & Company LLP (referred to as "we") to conduct a performance audit of costs incurred by Raytheon BBN Technologies (Raytheon BBN). Raytheon BBN was established in its current form in October 2009 when Raytheon, a for-profit company that specializes in defense contracting, acquired BBN Technologies, a research and development services firm. At the time of the acquisition, BBN Technologies had been awarded 11 NSF awards (grants and cooperative agreements), and it received an additional seven NSF awards after the acquisition. During our audit period of October 1, 2012, through September 30, 2015, Raytheon BBN claimed more than \$49 million in expenditures on Federal Financial Reports (FFRs) and through the Award Cash Management Service (ACMS) related to nine NSF awards. Figure 1 illustrates the costs claimed by budget category, based on the accounting data provided by Raytheon BBN.

Figure 1: Costs Claimed by NSF Budget Category from October 1, 2012, to September 30, 2015



Source: Auditor analysis of accounting data provided by Raytheon BBN.

This performance audit, conducted under Contract No. D15PB00570, was designed to meet the objectives identified in the Objectives, Scope, and Methodology (OSM) section of this report and was conducted in accordance with Generally Accepted Government Auditing Standards, issued by the U.S. Government Accountability Office. We communicated the results of our audit and the related findings and recommendations to Raytheon BBN and the NSF OIG.

II. AUDIT RESULTS

As described in the OSM section of this report, this performance audit included obtaining transaction-level data for all costs that Raytheon BBN claimed on NSF awards during the audit period. We judgmentally selected a sample of 250 transactions totaling \$2,832,138. This sample included 50 transactions totaling \$284,778 that we selected from Raytheon BBN's general ledger and 200 transactions totaling \$2,547,360 that we selected from general ledger detail records that Raytheon BBN's sub-awardees provided to support amounts invoiced to Raytheon BBN.

Based on the results of our testing, we determined that Raytheon BBN did not always comply with all Federal, NSF, and organization-specific requirements. As a result, we questioned \$96,106 in costs claimed by Raytheon BBN during the audit period. Specifically, we noted that Raytheon BBN does not have sufficient policies and procedures in place to ensure that all costs claimed by sub-awardees conformed to NSF award terms and conditions and applicable Federal financial assistance requirements.

We provide a breakdown of the questioned costs by finding in Appendix A of this report.

Finding 1: Sub-Award Expenses Not Allocable to NSF Awards

Raytheon BBN did not ensure that all costs claimed by sub-awardees were allowable in accordance with the applicable cost principles and Federal regulations before it charged the expenses to NSF. As a result, Raytheon BBN claimed \$96,106 of unsupported or unallowable costs incurred by sub-awardees. Specifically, we noted the following:

- **NSF Award** [REDACTED]
Langston University was unable to provide transaction-level detail to support \$23,861 that it invoiced Raytheon BBN for expenses incurred for the period from September 1, 2008, to March 31, 2012. As the university was unable to support that the costs billed to Raytheon BBN were allocable to the NSF award in accordance with 2 Code of Federal Regulations (CFR) 220 and the *NSF Award and Administration Guide* (AAG), we were unable to determine the allowability of the claimed costs. We are therefore questioning the total invoice amount of \$23,861.
 - **NSF Award** [REDACTED]
The University of Houston included scholarship and fellowship expenses in the modified total direct cost (MTDC) base used to calculate indirect expenses for an invoice that the university submitted to Raytheon BBN for expenses incurred from October 1, 2011, to November 30, 2012. As 2 CFR 220 specifically states that scholarship and fellowship expenses should not be included in the MTDC base, we are questioning \$1,158 of unallowable indirect costs.
 - **NSF Award** [REDACTED]
ON.LAB's invoices to Raytheon BBN for expenses incurred in October 2012 and February 2013 included \$6,971 of costs associated with unsupported salary expenses. ON.LAB was unable to provide documentation to support that the costs incurred were allocable to the NSF award in accordance with 2 CFR 220 and the NSF AAG. We are therefore questioning \$6,971 of unsupported salary expenses.
- Stanford University included personal travel expenses in an invoice submitted to Raytheon BBN for costs incurred during the period from October 1, 2009, to March 31, 2012. As 2 CFR 220 and the NSF AAG require expenses to be allocable to the awards charged and the personal travel was not incurred for the purposes of this award, we are questioning \$307 of unallocable travel expenses.
- **NSF Award** [REDACTED]
Wayne State University included unreasonable salary expenses in an invoice submitted to Raytheon BBN for work performed in June, July, and August 2012. Specifically, the university claimed \$30,680 in salary expenses paid to a post-doctoral student for work performed during the 3-month summer period; however, the post-doctoral student's annual salary, which was not established until after the summer period, was \$30,000 for a

12-month appointment.¹ As 2 CFR 220 and the NSF AAG require awardees to charge salary at a rate not in excess of the base salary divided by the period to which the base salary relates, paying this employee based on a higher rate caused the university to charge unallowable expenses to the award. We are therefore questioning \$47,764 of salary, fringe, and indirect expenses inappropriately charged to this award.

Indiana University included non-grant-related travel expenses in an invoice submitted to Raytheon BBN for costs incurred in August 2012. Specifically, the invoice included non-business travel expenses and travel expenses that should have been allocated to another agreement that the university had with Raytheon BBN at the time. As 2 CFR 220 and the NSF AAG require expenses to be allocable to the awards charged, and as the travel identified was not incurred for the purposes of this award, we are questioning \$791 of unallocable travel expenses.

- **NSF Award** [REDACTED]
Indiana University included unreasonable salary expenses in an invoice submitted to Raytheon BBN for work performed in June 2015. Specifically, the invoice claimed \$14,779 for salary provided as termination pay to an employee who underwent a change in appointment status during the sampled month.² The sub-awardee acknowledged that it had incorrectly allocated the termination pay to the project. As 2 CFR 220 and the NSF AAG require expenses to be allocable to the award charged, we are questioning \$14,779 of unallocable salary expenses.

The Georgia Tech Research Corporation included tuition remission expenses in the MTDC base used to calculate indirect costs invoiced to Raytheon BBN for expenses incurred from November 1 to December 31, 2014. As 2 CFR 220 specifically states that tuition remission expenses should not be included in the MTDC base, we are questioning \$475 of indirect costs that should not have been charged to this award.

Because Raytheon BBN was responsible for monitoring sub-award spending, it is responsible for the unallowable costs identified above, per the policies and procedures outlined in NSF's AAG. Specifically, Chapter V, Section A of NSF's AAG states that sub-awardees under NSF grants are subject to those cost principles and procedures appropriate to the sub-award type, and that the grantee organization is ultimately responsible for ensuring that all costs charged to NSF awards meet the requirements of the applicable cost principles, grant terms and conditions, and other specific award or program requirements.

¹ The sub-awardee stated that after hiring the post-doctoral student in June 2012, 9 months after the NSF award became effective, it paid the individual the full amount of the Year One funding budgeted for this position.

² When an employee of the sub-awardee undergoes a change in appointment status, the sub-awardee pays out the accumulated leave balance to the employee as termination pay; this amount is allocated across projects in accordance with the employee's effort.

Raytheon BBN’s invoice review process did not require sub-awardees to provide documentation to support the total costs claimed on each invoice, and Raytheon BBN does not obtain or review supporting documentation to identify unallowable costs billed by sub-awardees. As a result, Raytheon charged NSF for costs that were not allocable, reasonable, or allowable with regard to NSF awards. We are therefore questioning \$96,106 of sub-award expenses charged to NSF, as shown in Table 1:

Table 1: Questioned Sub-Award Expenses Charged to NSF

NSF Award No.	FYs	Questioned Costs
[REDACTED]	2008-2012	\$23,861
	2012-2013	1,158
	2012-2013	7,278
	2012	48,555
	2015	15,254
Total Questioned Costs		<u>\$96,106</u>

Source: Auditor analysis of non-compliant transactions.

Recommendations

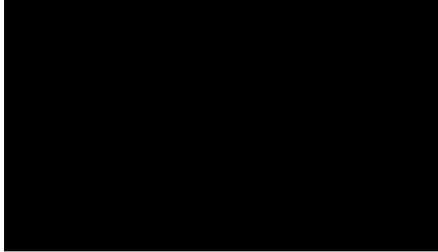
We recommend that NSF’s Director of the Division of Institution and Award Support request that Raytheon BBN:

1. Repay NSF the \$96,106 of questioned costs.
2. Strengthen the administrative and management controls and processes related to sub-awardee invoices that are charged to Federal awards. Processes could include:
 - a. Requiring sub-awardees to periodically provide documentation supporting the total costs invoiced during the period and requiring appropriate Raytheon BBN personnel to judgmentally review the supporting documentation for a sample of high-risk expenditures before approving the invoice for payment.
 - b. Recalculating the appropriate amount of indirect costs billed in an invoice to ensure that the sub-awardee used the appropriate MTDC base.

Raytheon BBN Response: Raytheon BBN agreed to repay NSF the \$96,106 of questioned costs identified in Table 1 above and noted that it has already refunded the \$14,778 in questioned costs associated with the Indiana University sub-award. Raytheon also stated that it will take Recommendation 2 into consideration as it continues to update and enhance its oversight and controls to ensure that all costs are current, accurate, and complete.

Auditors' Additional Comments: Our position regarding this finding does not change.

COTTON & COMPANY LLP



APPENDIX A: SCHEDULE OF QUESTIONED COSTS BY FINDING

NATIONAL SCIENCE FOUNDATION
ORDER # D15PB00570
PERFORMANCE AUDIT OF COSTS CLAIMED ON NSF AWARDS
RAYTHEON BBN TECHNOLOGIES

SCHEDULE OF QUESTIONED COSTS BY FINDING

Finding	Description	NSF Award No.	Total Questioned Costs	
			Unsupported	Unallowable
1	Sub-Award Expenses Not Allocable to NSF Awards	[REDACTED]	<u>\$23,861</u>	
				\$1,158
				7,278
				48,555
				<u>15,254</u>
Total			<u>\$23,861</u>	<u>\$72,245</u>

APPENDIX B: RAYTHEON BBN TECHNOLOGIES RESPONSE

Raytheon BBN Technologies

August 24, 2017

████████████████████
Cotton & Company LLP
635 Slaters Lane, 4th Floor
Alexandria, VA 22314

Reference: National Science Foundation OIG/Cotton & Company LLP Draft Incurred Cost Audit Report

Subject: Raytheon BBN Technologies Response to Report Recommendations

Dear ██████████:

Raytheon BBN Technologies (herein Raytheon BBN) reviewed the draft audit report, with the findings related to sub-awardee expenses, along with the below recommendations.

1. Raytheon BBN Technologies repay NSF the \$96,106 of sub-awardee questioned costs.
2. Raytheon BBN Technologies strengthen the administrative and management controls and processes related to sub-awardee invoices that are charged to Federal awards.

Raytheon BBN will repay the National Science Foundation, for the total amount of sub-awardee questioned costs identified in the subsequent table:

Table 1: Questioned Costs of Sub-Award Expenses Charged to NSF NSF Award No.	FYs	Questioned Costs
██████████	2008-2012	\$23,861
	2012-2013	1,158
	2012-2013	7,278
	2012	48,555
	2015	15,254
Total Questioned Costs		\$96,106

Please note that Raytheon BBN already received a refund from Indiana University on NSF Award ██████████. The refund was in the amount of (\$14,778.20) and Raytheon BBN subsequently applied this refund as a credit to NSF as part of invoice #254086 (Voucher #67), dated 12 June 2017. Raytheon BBN will further discuss the audit report findings with the remaining sub-awardees with questioned costs and will attempt to recover these costs to make Raytheon BBN whole.

With regards to the second recommendation, Raytheon BBN recognizes the importance of having the right administrative and management oversight and proper controls in place to govern sub-awardee

spending. Raytheon BBN has several checks and balances in place to try and capture any expenditures that might not be reasonable, allocable, and allowable per the governing cost principles. Raytheon BBN's due diligence process begins prior to issuing a sub-awardee agreement to any participating member. These controls include ensuring sub-awardees provide valid Reps and Certs to support their proposals as well as confirming each has an approved accounting systems in place to be in compliance with the federal regulations associated with each federal award. Furthermore, Raytheon BBN's controls continue throughout the project lifecycle through technical, financial, and contractual oversight from Program Management, Program Controls (Finance), and Subcontract Management respectively.

Raytheon BBN will continue to update and enhance its oversight and controls and take into consideration this recommendation for future process improvements in order to help ensure that all costs are current, accurate, and complete.

Please contact me at [REDACTED] or via email at [REDACTED] should you have any questions or require further information.



APPENDIX C: OBJECTIVES, SCOPE, AND METHODOLOGY

OBJECTIVES, SCOPE, AND METHODOLOGY

The NSF OIG Office of Audits engaged Cotton & Company LLP (referred to as “we” in this report) to conduct a performance audit of costs that Raytheon BBN incurred on NSF awards for the period from October 1, 2012, to September 30, 2015. The objective of the audit was to determine if costs claimed by Raytheon BBN during this period were allocable, allowable, reasonable, and in conformity with NSF award terms and conditions and applicable Federal financial assistance requirements.

Our work required us to rely on computer-processed data obtained from Raytheon BBN and NSF OIG. NSF OIG provided data on each award that Raytheon BBN reported on FFRs and through ACM\$ during our audit period, and Raytheon BBN provided detailed transaction-level data for all costs charged to NSF awards during the period. This resulted in a total audit universe of \$49,586,697 in costs claimed on nine NSF awards.

We assessed the reliability of the data provided by Raytheon BBN by (1) reviewing costs charged to NSF award accounts per Raytheon BBN’s accounting records and comparing them to reported net expenditures, as reflected in Raytheon BBN’s quarterly financial reports and ACM\$ drawdown requests submitted to NSF for the corresponding periods; and (2) reviewing the parameters that Raytheon BBN used to extract transaction data from its accounting records and systems.

Based on our assessment, we found Raytheon BBN’s computer-processed data to be sufficiently reliable for the purposes of this audit. We did not review or test whether the data contained in, or the controls over, NSF’s databases were accurate or reliable; however, the independent auditor’s report on NSF’s financial statements for fiscal year 2016 found no reportable instances in which NSF’s financial management systems did not substantially comply with applicable requirements.

Raytheon BBN management is responsible for establishing and maintaining effective internal controls to help ensure that Federal award funds are used in compliance with laws, regulations, and award terms. In planning and performing our audit, we considered Raytheon BBN’s internal control solely for the purpose of understanding the policies and procedures relevant to the financial reporting and administration of NSF awards, to evaluate Raytheon BBN’s compliance with laws, regulations, and award terms applicable to the items selected for testing, but not for the purpose of expressing an opinion on the effectiveness of Raytheon BBN’s internal control over award financial reporting and administration. Accordingly, we do not express an opinion on the effectiveness of Raytheon BBN’s internal control over its award financial reporting and administration.

After confirming the accuracy of the data provided but before performing our analysis, we reviewed all available accounting and administrative policies and procedures, relevant documented management initiatives, previously issued external audit reports, and desk review reports to ensure that we understood the data and that we had identified any possible weaknesses within Raytheon BBN’s system that warranted focus during our testing.

We began our analytics process by reviewing the transaction-level data that Raytheon BBN provided. We summarized the total costs claimed by NSF budget category and noted that sub-award expenses represented █ percent of the total direct costs claimed during our audit period. We then summarized the total expenses by award number and determined that, for six of the nine NSF awards, sub-award expenses represented more than █ percent of the costs claimed. The table below shows sub-award costs claimed and total costs claimed for each of the nine NSF awards.

NSF Award No.	Sub-Award Costs Claimed	Total Costs Claimed
█	█	\$40,875
█	█	1,456,401
█	█	1,743,494
█	█	1,785,564
█	█	79,126
█	█	12,620,235
█	█	11,507,411
█	█	15,193,083
█	█	5,093,304

Source: Auditor analysis of accounting data provided by Raytheon BBN.

As sub-awards do not typically represent such a large portion of awardee expenses, we discussed the audit population with NSF OIG and agreed to use different sample selection and testing methodologies based on the amount of funding spent on sub-awards.

For the three awards that did not incur sub-award costs, we:

1. Judgmentally reviewed all costs charged to the NSF award per Raytheon BBN’s general ledger and selected a sample of 50 expenses to test.
2. Provided Raytheon BBN with a list of the sampled expenditures and requested documentation to support the sampled transactions.
3. Reviewed the documentation that Raytheon BBN provided to support the sampled expenditures and requested additional documentation and justifications as necessary to evaluate whether the expenses were allocable, reasonable, and allowable with regard to the NSF awards charged.

For the six awards for which sub-award expenses represented more than 84 percent of the costs claimed, we:

1. Judgmentally reviewed all relevant sub-award transactions identified in Raytheon BBN’s general ledger and selected a sample of large-dollar sub-award expenses from a variety of sub-awardees. For each sub-award expense sampled, we requested that Raytheon:
 - a. Provide documentation from the sub-awardee to support the total costs claimed per the general ledger, including the sub-awardee’s invoice.

- b. Contact the sub-awardee and request that it provide Cotton & Company with the general ledger data supporting the total cost claimed per the sampled invoice.
2. Performed the following steps upon receiving the general ledger detail from the sub-awardees:
 - a. Reconciled the general ledger amount to the total claimed per the sampled invoice and investigated all discrepancies identified.
 - b. Verified that the sub-awardee appropriately applied all indirect costs to the invoiced expenses in accordance with the sub-awardee's Negotiated Indirect Cost Rate Agreement (NICRA).
 - c. Selected a sample of one or more transactions from the general ledger data provided until we had selected 200 transactions.
 - d. Requested and reviewed all documentation provided by the sub-awardees to support the 200 sampled expenditures and requested additional documentation and justifications as necessary to evaluate whether the expenses were allocable, reasonable, and allowable with regard to the NSF awards charged.

At the conclusion of our fieldwork, we provided a summary of our results to NSF OIG personnel for review. We also provided the summary of results to Raytheon BBN personnel to ensure that they were aware of each of our findings and did not have any additional documentation available to support the questioned costs.

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. Those standards require us to obtain reasonable assurance that the evidence provided is sufficient and appropriate to support the auditors' findings and conclusions in relation to the audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.



NATIONAL SCIENCE FOUNDATION
OFFICE OF INSPECTOR GENERAL