STATE OF NORTH CAROLINA

PERFORMANCE AUDIT

OFFICE OF INFORMATION TECHNOLOGY SERVICES

IT PROJECT BUDGET AND SCHEDULE VARIANCES

APRIL 2013

OFFICE OF THE STATE AUDITOR

BETH A. WOOD, CPA

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Beth A. Wood, CPA
State Auditor

2 S. Salisbury Street
20601 Mail Service Center
Raleigh, NC 27699-0601
Telephone: (919) 807-7500
Fax: (919) 807-7647
Internet
http://www.ncauditor.net

April 22, 2013

The Honorable Pat McCrory, Governor
Members of the North Carolina General Assembly
Mr. Chris Estes, State Chief Information Officer,
Office of Information Technology Services

Ladies and Gentlemen:

We are pleased to submit this performance audit titled *Office of Information Technology Services, IT Project Budget and Schedule Variances*. The audit objectives were to determine if (1) state IT project actual costs and schedules differ significantly from original estimates, and (2) controls are in place to provide reasonable assurance that the Office of Information Technology Services has complete, accurate, and timely IT project information. Mr. Estes reviewed a draft copy of this report. His written comments are included in the appendix.

The Office of the State Auditor initiated this audit to improve the oversight and management of state IT projects.

We wish to express our appreciation to the staff of the Office of Information Technology Services for the courtesy, cooperation, and assistance provided us during the audit.

Respectfully submitted,

Beth A. Wood

Beth A. Wood, CPA
State Auditor

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SUMMARY

PURPOSE

This audit report evaluates whether: (1) state information technology (IT) project actual costs and schedules differ significantly from original estimates; and (2) controls are in place to provide reasonable assurance that the Office of Information Technology Services (ITS) has complete, accurate, and timely IT project information. The report makes recommendations so the Office of Information Technology Services, the Legislature, and the Governor can take appropriate corrective action.

RESULTS

ITS allows state agencies to contract with vendors and obligate state funds after approving the initial IT project cost and schedule estimates that state agencies submit to ITS. However, the initial estimates are not reliable predictors of the final cost and time schedules. For 84 IT projects reviewed, actual state agency IT project costs were more than twice (an additional $356.3 million) the original agency cost estimates and took about 65% (389 days) longer to complete than state agencies originally estimated. Inaccurate IT projects place the State at risk because ITS approves state agency projects based in part on those initial estimates. State agencies then contract with vendors and begin implementing the IT projects, all based on the inaccurate and unreliable cost and time estimates.

Three control weaknesses over the development of initial IT project cost and schedule estimates increase the risk that state IT projects will experience significant budget and schedule variances. First, ITS has not issued a standard practice for state agencies to follow when developing IT project estimates. Second, there are no policies in place that require an entity independent of the state agency that submits the estimate to verify that the estimate is reasonably accurate. And third, state agency managers are not required to manage IT projects so that the projects meet the initial cost or schedule estimates that are submitted to ITS.

Additionally, ITS does not have procedures in place to provide reasonable assurance that the data used to oversee state IT projects is complete, accurate, and timely. For example, ITS lacks a way to identify state agency IT projects that require the State Chief Information Officer's (SCIO) approval. Consequently, state agencies can circumvent the SCIO approval process. Another problem is that the Project Portfolio Management Tool does not retain the historical and current project information to allow for trending and analysis. Also, ITS does not have procedures in place to verify that the data state agencies enter in the Enterprise Project Management Office (EPMO) Project Portfolio Management Tool[1] is accurate. Lastly, ITS may not have the authority it needs to ensure that state agencies submit project status reports in a timely manner.

Consequently, inaccurate initial estimates and inaccurate data could prevent ITS from achieving its goals of helping state agencies meet project budgets and schedules.

[1] The Project Portfolio Management Tool is the licensed automated tool used by the State of North Carolina to define, report, and track IT Projects.

RECOMMENDATIONS

ITS should develop and publish written guidance for developing state agency IT project cost and schedule estimates. The guidance should also describe the education, experience, and credentials needed by the personnel who develop the estimates.

ITS should require state agencies to obtain independent validation of the accuracy and reasonableness of IT project estimates. Alternatively, ITS should require agencies to submit appropriate and adequate documentation so that ITS can evaluate and determine the accuracy and reasonableness of agency estimates.

ITS should request that the General Assembly consider enacting state law to hold state agency managers accountable and require them to meet IT project cost and schedule estimates.

ITS should develop and document a method to identify state agency IT projects that require the SCIO's approval. ITS should also ensure that the EPMO Tool retains both historical and current information to allow for trending and analysis.

ITS should develop and document procedures to verify state agency data in the EPMO Project Portfolio Management Tool.

ITS should consider asking the General Assembly for the authority to ensure that ITS receives project status reports on schedule.

AGENCY'S RESPONSE

The Agency's response is included in the appendix.

INTRODUCTION

BACKGROUND

In July of 2004, the General Assembly enacted Senate Bill 991 (SB 991) to improve information technology (IT) project management and reduce cost overruns. SB 991 was codified as *North Carolina General Statute, Chapter 147, Article 3D* and significantly increased the role of the State Chief Information Officer (SCIO) in State IT Management. The legislation requires the SCIO to review major IT projects and to approve or suspend projects as deemed appropriate. The legislation also directs the SCIO to provide project management assistance on approved projects.

Several state agencies are involved in the state IT project oversight process. Responsible agencies discussed in this report include:

- *State Agencies*: Responsible for notifying the SCIO when an information technology project has been initiated that the agency intends to submit to the review process. Once a project is approved, agencies are required to report periodically to the SCIO the project's cost, schedule, and "any other information related to the implementation of the information technology project."
- *State Chief Information Officer (SCIO)*: Has statutory authority to review, approve or deny major IT projects as well as suspend IT projects that fail to meet quality assurance standards. Although other agencies play a role in approving or denying a project, the SCIO has the final authority to approve a project.
- *Enterprise Project Management Office (EPMO)*: Responsible for reviewing state agency IT projects. Monitors agency progress and advises state agencies on project management. Housed within the Office of the SCIO, the EPMO provides status reports and makes recommendations regarding project continuation to the SCIO.
- *Office of Statewide Architecture (Architecture)*: Responsible for reviewing the technical components of the IT projects to ensure that the systems' designs meet the goals of the IT project. Housed within the Office of the SCIO.
- *Office of State Budget and Management (Budget)*: Reviews IT projects to ensure money is available and that the benefits justify the costs. Has statutory authority to disallow "any additional expenditure of funds for a project that has been suspended by the SCIO."
- *Office of State Controller (Controller)*: Reviews IT projects to ensure implemented systems do not conflict with North Carolina Accounting System. The State Controller is a member of the Review Committee charged with dispute resolution between agencies and the SCIO.

EPMO reported that as of March 11, 2013, state agencies had 128 active IT projects with a total budget of $1.7 billion.

OBJECTIVES, SCOPE, AND METHODOLOGY

The audit objectives were to determine if: (1) state IT project actual costs and schedules differ significantly from original estimates; and (2) controls are in place to provide reasonable assurance that the Office of Information Technology Services has complete, accurate, and timely IT project information.

The Office of the State Auditor initiated this audit to improve the oversight and management of state IT projects.

The audit scope included 84 IT projects documented in the ITS Project Portfolio Management Tool. The 84 projects were selected because they were the only projects for which original cost and schedule estimate data was available in the ITS Project Portfolio Management Tool. We conducted the fieldwork from December 2011 to October 2012.

To achieve our audit objectives, we interviewed ITS personnel, reviewed ITS procedure manuals, reviewed IT project documentation, and analyzed data for the ITS Project Portfolio Management Tool.

Because of the test nature and other inherent limitations of an audit, together with limitations of any system of internal and management controls, this audit would not necessarily disclose all performance weaknesses or lack of compliance.

As a basis for evaluating internal control, we applied the internal control guidance contained in professional auditing standards. As discussed in the standards, internal control consists of five interrelated components, which are (1) control environment, (2) risk assessment, (3) control activities, (4) information and communication, and (5) monitoring.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards 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.

We conducted this audit under the authority vested in the State Auditor of North Carolina by *North Carolina General Statute* 147.64.

1. ACTUAL COSTS AND SCHEDULES DIFFER SIGNIFICANTLY FROM ORIGINAL ESTIMATES

The Office of Information Technology Services (ITS) allows state agencies to contract with vendors and obligate state funds after approving the initial information technology (IT) project cost and schedule estimates that state agencies submit to ITS. However, the initial estimates are not reliable predictors of the final cost and time schedules. On average, actual state agency IT project costs are more than twice the original agency submitted cost estimates and take about 65% longer to complete than state agencies originally estimate. Three control weaknesses over initial IT project estimates increase the risk that state IT projects will experience significant budget and schedule variances. The control weaknesses include: (1) no standard practice for creating IT project estimates; (2) no independent validation of agency estimates; and (3) no accountability for unreliable estimates.

Projects Cost Twice As Much and Take 65% Longer Than Original Estimates

The actual costs of state IT projects are more than twice the original estimates based on data from the ITS Project Portfolio Management Tool (Project Database).[2] Additionally, the projects took 65.4% longer to complete than the original project estimates indicated.

State IT projects progress through five phases: (1) Initial Project Review & Approval; (2) Planning & Design; (3) Execution & Build; (4) Implementation; and (5) Closeout.

A review of 84 state IT projects indicates that actual project costs are more than twice the original project cost estimates. When first approved, the 84 projects were initially budgeted for $319.9 million. However, the final revised budgets indicate that the 84 projects will cost $676.2 million.

Furthermore, analysis indicates that project costs increased significantly even after the planning and design phase for the projects was completed - a time when estimated project costs should be reasonably close to final costs. Project costs for the 84 projects increased about $158.5 million between the time that the projects were initially approved and the time that planning and design for the projects was completed. But project costs increased another $197.8 million after the planning and design phase.

Not only do state agency IT projects cost significantly more than the agencies initially estimate, the projects also take significantly longer to complete than the agencies initially estimate. State IT projects take on average 65.4% (389 days) longer than the initial estimate to complete based on data from the Project Database. Project completion schedules for the 84 projects increased an average of 158 days between the time that the projects were initially approved and the time that planning and design for the projects was completed. The project schedules increased another 231 days after the planning and design phase.

[2] The Project Database is used to report a project's status to the ITS Enterprise Project Management Office Quality Assurance staff.

Auditors selected the 84 projects (see Appendix) with baseline data from the Project Database for review.[3] The Project Database contains data for 1,034 state agency IT projects. However, the Project Database's analytical usefulness is limited because: (1) it only contains original cost and schedule estimate data (baseline data) for 84 of the 1,034 projects; and (2) it only contains cost data for a project's current phase (older data is overwritten and no longer available).

Despite the data limitations noted above, analysis of the Project Database data indicates that initial agency cost and schedule estimates are generally inaccurate.

Alternative Measures Proposed by ITS

ITS personnel proposed two (2) changes to the auditor's methodology for measuring how close initial project cost and schedule estimates came to actual costs and schedules.

First, ITS personnel proposed eliminating the following three (3) projects from the analysis:

- Department of Revenue Tax Information Management Systems (TIMS),
- Criminal Justice Law Enforcement Automated Data Services (CJLEADS),
- Medicaid Management Information Systems (MMIS).

ITS personnel argues that the projects listed above may skew the analysis results because they are projects with agreed upon business scope changes, like TIMS and CJLEADS, or they are large projects with problems, like MMIS.

Removing the projects listed above from the analysis would show that actual project costs are 44.4% ($99.8 million) more than the original project cost estimates and take on average 64.1% (371 days) longer to complete than initially estimated.

These projects are included in the analysis because they demonstrate the large monetary impact that inaccurate estimates for a few large IT projects can have on state spending. The monetary impact of these projects demonstrates the need to create IT project estimates that accurately identify state needs, include and document planned project expansions, and provide a range of costs and associated probabilities to account for contingencies that could affect project completion.

Second, ITS personnel proposed using the cost and schedule estimates developed at the end of the Planning & Design phase instead of the initial cost and schedule estimates submitted by the state agency and approved by ITS.

[3] Because auditors only selected projects with baseline data, total program costs were not captured in the analysis where a project had been divided into several smaller projects. For example, the NC Medicaid Management Information Systems (MMIS) program had been divided into twelve separate projects. However, only two of the twelve projects had baseline data that could be compared with final project costs. Consequently, only two of the MMIS projects were included in the analysis. As a result, total MMIS program costs were not captured in the analysis.

Removing the projects listed above from the analysis and using the estimates developed at the end of the Planning & Design phase would show that actual project costs are 3.1% ($9.6 million) more than the original project cost estimates and take on average 28.2% (210 days) longer to complete than initially estimated.

However, using the estimate developed at the end of the Planning & Design phase would not give the reader a full appreciation of the risk that the State takes when it approves IT projects based on inaccurate initial estimates.

Using the estimate developed at the end of the Planning & Design phase might be appropriate if that was the basis for and the point at which the State contracted with a vendor.

But ITS allows state agencies to begin contracting with vendors before the Planning & Design phase based on the initial ITS approved estimates. ITS personnel explained that state agencies could not know how much a project was going to cost or how long it was going to take until after the agency had a contract with a vendor. Therefore, ITS allows state agencies to contract with a vendor and then work with the vendor to create a more accurate estimate at the end of the Planning & Design phase.

Allowing state agencies to contract with vendors based on inaccurate initial estimates places the State at risk. Signing a contract with a vendor before the project requirements, costs, and schedules are reasonably known legally obligates the State to a vendor and almost guarantees that the contract amount will have to be increased later so that the State can complete the project. Furthermore, the contract increases will occur without the benefit of competitive bidding to ensure that the State receives the best price for the contract changes. This system almost invites a vendor to obtain the contract with an unreasonably low bid and to later increase the contract amount through change orders.

In fact, allowing agencies without reasonably accurate project estimates to contract with a vendor contradicts best practices used by the federal government. The Office of Management and Budget (OMB) requires federal agencies to have reasonably accurate estimates or to take steps to obtain reasonably accurate estimates before an agency contracts with a vendor at the end of the Planning & Design phase.[4]

Consequently, auditors did not include the ITS recommendations in the analysis methodology.

No Standard Practice for Creating IT Project Estimates

ITS has not issued a standard practice for state agencies to follow when developing IT project estimates. ITS has prepared a Cost Breakdown Template that provides a place for agencies to document six cost categories for each of the five project phases. Also, ITS has provided instructions for entering cost estimation data into the Application Portfolio

[4] OMB, Capital Programming Guide, 2011

Management Tool. However, ITS has not provided detailed instructions and best practices for preparing estimates.

Furthermore, ITS has not provided recommendations about the experience and qualifications needed by state personnel who prepare or submit IT project cost and schedule estimates.

ITS practices differ significantly from best practices used by the federal government.

First, the Government Accountability Office (GAO) identified and published best practices for producing reliable estimates. The GAO says that reliable estimates are critical to delivering projects on-time and on-budget. The "GAO Cost Estimating and Assessment Guide," states:

> "The ability to generate reliable cost estimates is a critical function, necessary to support the Office of Management and Budget's (OMB) capital programming process. Without this ability, agencies are at risk of experiencing cost overruns, missed deadlines, and performance shortfalls - all recurring problems that our program assessments too often reveal. Furthermore, cost increases often mean that the government cannot fund as many programs as intended or deliver them when promised."

The GAO also notes that "Certain best practices should be followed if accurate and credible cost estimates are to be developed." To that end, the GAO developed and published the "GAO Cost Estimating and Assessment Guide." The GAO states:

> "The methodology outlined in this guide is a compilation of best practices that federal cost estimating organizations and industry use to develop and maintain reliable cost estimates throughout the life of a government acquisition program. By default, the guide will also serve as a guiding principle for our auditors to evaluate the economy, efficiency, and effectiveness of government programs."

Second, the GAO recognizes that cost estimate preparation is a technical function that requires technical skills and expertise. For example, the GAO has identified problems with the risk analysis included in some cost estimates. The "GAO Cost Estimating and Assessment Guide" states:

> "A risk analysis should be part of every cost estimate, but it should be performed by experienced analysts who understand the process and know how to use the appropriate tools. On numerous occasions, GAO has encountered cost estimates with meaningless confidence intervals because the analysts did not understand the underlying mathematics or tools."

There is an increased risk that state agencies will not produce reliable initial cost and schedule estimates when the oversight agency (ITS) has not provided written guidance for preparing reliable estimates and made recommendations about the experience and qualifications needed by those who prepare the estimates.

No Independent Validation of Agency Estimates

There are no policies in place that require state agencies to obtain independent validation of the accuracy of their initial estimates. Additionally, ITS does not expect the agency's initial estimates to be accurate. ITS does not expect accurate estimates until the beginning of the Execution & Build phase. In its project management methodology, ITS states:

> "Initial budgetary estimates are often based on availability of funds or may be dictated by legislation or grant size. These parameters may or may not coincide with the actual funds needed to perform the project. For this reason, budget estimates are refined in the Planning phase until they are base lined at the beginning of Execution & Build."[5]

However, not having accurate cost and schedule estimates until the beginning of the Execution & Build phase can be a problem. State agencies are allowed to contract with vendors and obligate state resources before the Execution & Build phase. Because contracts are signed before reliable costs and schedules are available, cost increases are likely to occur and project change requests must be submitted for the unanticipated budget and schedule changes. But after a contract is signed with a vendor every change request will carry the same risk as a sole source contract because there will be no competitive bidding process to ensure that the State is getting the best price on the changes. It's worth noting that an ITS analysis of state agency IT project change requests shows that most change requests are for budget and schedule changes.

Furthermore, ITS has not established a written standard that describes how accurate an agency's estimate should be.

ITS management provided auditors with an example of an accuracy expectation in the Project Management Body of Knowledge (PMBOK) issued by the Project Management Institute. The example that ITS management provided states:

> "Cost estimates should be refined during the course of the project to reflect additional detail as it becomes available. The accuracy of a project estimate will increase as the project progresses through the project life cycle. Hence cost estimating is an iterative process from phase to phase. For example, a project in the initiation phase could have a rough order of magnitude (ROM) estimate in the range of ±50%. Later in the project, as more information is known, estimates could narrow to a range of ±10%. In some organizations, there are guidelines for when such refinements can be made and the degree of accuracy that is expected."

However, initial agency cost estimates differ significantly more than ±50% from final project costs. Additionally, the example listed above is not documented in ITS policies and procedures as a standard for state agency estimates.

[5] ITS, Project Management Methodology, Version 1.0, June 9, 2009, pg. 20

In contrast to the ITS policy, the federal government requires estimates to be independently validated for reasonableness. Because reliable cost estimates are critical, OMB requires the reasonableness of IT project estimates to be independently verified. In an August 4, 2005, memorandum for Chief Information Officers, OMB stated:

1. "For all new major IT projects, before beginning development, ensure cost, schedule, and performance goals are independently validated for reasonableness.
2. For all ongoing major IT projects with development efforts (DME), before obligating FY 2006 funds, begin independently validating for reasonableness current cost, schedule, and performance baselines, taking corrective actions as necessary. Independent validations should be completed by March 31, 2006. If proposed corrective actions include re-baselining (changing the performance measurement baseline – planned scope of work, schedule, budgeted costs, or all three), the proposal must be approved by OMB."

There is an increased risk that state agency initial cost and schedule estimates will not be reliable when the oversight agency (ITS) does not require independent validation of the estimate's reasonableness and accuracy.

No Accountability For Reliable Estimates

State agency managers are not required to manage IT projects so that the projects meet the initial cost or schedule estimates that are submitted to ITS.

ITS acknowledges the importance of accountability. ITS notes, "An agency being accountable for IT projects and applications helps to deliver the expected business results in a timely and cost effective manner."[6]

However, there is no state law that requires state agency managers to manage an IT project so that the IT project is delivered in accordance with the initial agency estimates.

To the contrary, federal best practices require accountability. OMB and Congress hold federal agencies accountable for creating reliable estimates. The OMB "Capital Programming Guide" states:

> "It is critical that the cost estimates are realistic estimates of the final costs and are adjusted to consider risk. When seeking funds during the budget process, the credibility of the costs will be examined, and OMB and the Congress will hold agencies accountable for meeting the schedule and performance goals within the cost estimates."

Additionally, federal law requires federal agency managers to manage their IT projects so that the projects are delivered within 10 percent of the budgeted amount. Federal law 41 U.S.C. Section 263 (a) states:

[6] ITS, Enterprise Project Management Office Value Proposition

> "It is the policy of Congress that the head of each executive agency should achieve, on average, 90 percent of the cost performance, and schedule goals established for major acquisition programs of the agency."

There is an increased risk that state agency IT projects will experience cost and schedule overruns when agency managers are not required to manage IT projects to meet approved estimates.

Inaccurate Estimates Can Result in Unplanned Spending and Resource Use

Inaccurate project estimates can lead to cost overruns and schedule slippages that result in unplanned spending and resource consumption. ITS notes, "Budget overruns, schedules slippages, unmet requirements and capabilities, poor deliverables' quality, and additional lifetime maintenance and operation expenses create wasted and unproductive fiscal resources."[7]

Budget variances can result in millions of dollars in unplanned spending. For example, the State experienced a:

- $96.8 million budget increase for the Department of Revenue's Tax Information Management System project from $525,000 to $97.3 million.
- $23 million budget increase in the Office of the State Controller's Criminal Justice Data Integration Pilot for Wake County project from an initial budget of $2.1 million to a revised budget of $24.7 million.
- $23 million budget increase in the Department of Health and Human Service's NC FAST Global Case Management and Food & Nutrition project from an initial budget of $25.2 million to a revised budget of $48.2 million.

Also, schedule variances delay when North Carolina and its citizens can benefit from the cost savings and improved services that the new technology was promised to deliver. For example, the State experienced a:

- 1,307 day schedule increase in the Department of Health and Human Service's Vital Records and Statistics Automation System project from an initial estimate of 2,371 days-to-complete to a revised schedule of 3,678 days-to-complete.
- 1,237 day schedule increase in the Employment Security Commission's Initial Claims Call Center project from an initial estimate of 669 days-to-complete to a revised schedule of 1,906 days-to-complete.
- 1,184 day schedule increase in the Office of the State Controller's Criminal Justice Data Integration Pilot for Wake County project from an initial estimate of 240 days-to-complete to a revised schedule of 1,424 days-to-complete.

Inaccurate initial estimates could keep ITS from achieving its goals of helping state agencies meet project budgets and schedules. ITS states, "The primary goal of the

[7] ITS, Enterprise Project Management Office Project Assessment Process Guidelines, Version 1.7, July 1, 2011, pg. 5

EPMO project oversight process is to ensure that all major technology projects meet the required deliverables, budget, schedule, scope, and performance milestones, and meet client expectations leading to quality deliverables."[8] Starting a project with inaccurate estimates can only hinder the efforts of ITS.

Furthermore, inaccurate initial estimates could keep ITS from achieving the Legislature's objectives. State statutes clearly show that the Legislature intends to reduce cost and schedule variances. For example, the 2004 Senate Bill 991 was titled:

> "An Act to Improve State Government Information Technology Planning, Adopt Standards, Make Project Development More Efficient, **Reduce Cost Overruns**, Provide Assistance to State Agencies, and Increase Accountability." (emphasis added)

The additional authority given to the SCIO provides further evidence of the Legislature's intent to reduce cost and schedule variances. The Legislature gave the SCIO the authority to require the provisions of IT project contracts to "include monetary penalties for projects that are not completed within the specified time period or that involve costs in excess of those specified in the contract."

Recommendation: ITS should develop and publish written guidance for developing state agency IT project cost and schedule estimates. The guidance should also describe the education, experience, and credentials needed by the personnel who develop the estimates.

ITS should require state agencies to obtain independent validation of the accuracy and reasonableness of IT project estimates. Alternatively, ITS should require agencies to submit appropriate and adequate documentation so that ITS can evaluate and determine the accuracy and reasonableness of agency estimates.

ITS should request that the General Assembly consider enacting a state law to hold state agency managers accountable and require them to meet IT project cost and schedule estimates.

[8] ITS, Enterprise Project Management Office Project Assessment Process Guidelines, Version 1.7, July 1, 2011, pg. 5

2. PROCEDURES DO NOT ENSURE COMPLETE, ACCURATE, AND TIMELY DATA

The Office of Information Technology Services (ITS) lacks procedures to provide reasonable assurance that the data used to oversee state information technology (IT) projects is complete, accurate, and timely.

No Reasonable Assurance That IT Project Data Is Complete

ITS procedures are not adequate to ensure that data in the Enterprise Project Management Office's (EPMO) Project Portfolio Management Tool[9] (Tool) is complete for two reasons.

First, IT project data may not be complete because ITS does not have a method to identify IT projects that circumvent the approval process. *North Carolina General Statute 147-33.72C* prohibits state agencies from proceeding with IT projects without State Chief Information Officer (SCIO) approval. However, state agencies can circumvent the State's project approval process because agencies have the ability to spend money on projects even if the agency does not have the SCIO's approval. Additionally, the statute requires the Office of State Budget and Management (Budget) to prevent state agencies from spending funds on unapproved projects. Nevertheless, Budget does not have a mechanism to prevent agencies from spending money on unapproved projects.

The problem with state agencies circumventing the approval process was first identified over five years ago in a July 2007 report[10] issued by the Office of the State Auditor. The report states,

> "During our analysis, we identified projects that were implemented even though they were not approved in the State Approval process. Thus, it appears agencies may have the flexibility to intentionally or unintentionally circumvent the State approval process. While there may be some instances when the State Approval process must be modified to accommodate projects with high priority, the EPMO cannot control the outcome of projects that are not required to go through the formal review process, at which point potential risk issues might be identified and addressed."

Second, IT project data may not be complete because ITS procedures do not ensure that the Tool preserves historical project data. IT project data is overwritten in the Tool as the project progresses through the project phases. Some data elements, such as baseline budget and schedule data, have been preserved in recent years. However, other historical data have not been preserved. For example, initial project budget and schedule information is overwritten to reflect the most current information as the project parameters change.

[9] The Project Portfolio Management Tool is the licensed automated tool used by the State of North Carolina to define, report, and track IT Projects.
[10] Office of the State Auditor, Performance Assessment – Enterprise Project Management Office, July 2007

Complete IT project data from the EPMO is necessary for the SCIO oversight function. *North Carolina General Statute 147-33.72C* gives the SCIO oversight responsibilities to review, approve, and suspend state agency IT projects. The EPMO conducts project assessments and provides the information to the SCIO so that the SCIO can perform the oversight function. The "Enterprise Project Management Office Project Assessment Process Guidelines" states, "The intent is to provide complete, accurate, and timely project information to the SCIO in order to facilitate accomplishment of legislatively mandated oversight duties and responsibilities."

Without procedures to ensure that state agency IT projects are identified and properly reviewed, the SCIO cannot properly perform its oversight function. As a result, IT projects could experience problems such as cost overruns, schedule slippage, and unmet requirements.

Furthermore, ITS cannot analyze past events to identify negative trends in state agency IT projects without historical project data. Identifying and analyzing negative trends is a way of identifying at-risk projects. The "Enterprise Project Management Office Project Assessment Process Guidelines" states that "constant re-baselining" and "frequent schedule or milestone changes" are symptoms of an "at risk" project. However, the EPMO Tool alone does not provide enough information to analyze historical project data. The EPMO Tool has a document management section that lists changes to the project data, but the budget and schedule data must be obtained from manual documents. Consequently, analysis of several projects could be labor intensive and time consuming. Without readily available historical information for automated comparison and analysis, ITS may not be able to identify problem projects in a timely manner.

No Reasonable Assurance That IT Project Data Is Accurate

ITS procedures are not adequate to ensure that data in the Tool is accurate. ITS relies on state agencies to provide IT project information such as cost, schedule, and performance data. State agencies input this information directly into the Tool. However, ITS does not independently verify and validate the information that the agency enters in the Tool.

ITS oversight procedures require accurate IT project data. The "Enterprise Project Management Office Project Assessment Process Guidelines" states,

> "The primary objective of the EPMO project assessment is to provide complete, **accurate**, and defensible project information to the Chief Information Officer through the EPMO director. … To accomplish this reporting requirement, the EPMO staff will use project documents, tools, and analysis techniques to verify and validate project status." (emphasis added)

Without procedures to ensure that state agency IT project data is accurate, the SCIO may not have the information necessary to adequately perform the legislated oversight responsibilities. As noted above, *North Carolina General Statute 147-33.72C* gives the SCIO oversight responsibilities to review and approve state agency projects. The statute also allows the SCIO to suspend an IT project "that does not continue to meet the

applicable quality assurance standards." Failure to independently verify state agency self-reported data could prevent the SCIO from timely identifying troubled projects.

No Reasonable Assurance That IT Project Data Is Timely

ITS procedures are not adequate to ensure that project status is updated timely. ITS requires state agencies to provide monthly IT project status reports. However, ITS does not have procedures in place to compel state agencies to submit the reports on-time. On December 31, 2011, for example, 27 out of 78 project reports (35%) were overdue by two months or more:

- 1 status report was 5 months overdue;
- 2 status reports were 4 months overdue;
- 10 status reports were 3 months overdue;
- 14 status reports were 2 months overdue.

ITS oversight procedures require timely IT project status reports. The "Enterprise Project Management Office Project Assessment Process Guidelines" states "Monitoring and reporting are project control tools that provide assurance that the project is meeting expectations." The guidelines further state the intent of the ITS project assessments "is to provide complete, accurate, and **timely** project information to the SCIO in order to facilitate accomplishment of legislatively mandated oversight duties and responsibilities."

Without procedures to compel state agencies to timely submit IT project status reports, the SCIO may not have the information necessary to adequately perform the legislated oversight responsibilities. As a result, the SCIO may not determine in a timely manner that project processes are deviating from the approved plan, the project schedule is not in accordance with the plan, and project costs are not in accordance with the approved budget. (emphasis added)

Recommendation: ITS should develop and document a method to identify state agency IT projects that require the SCIO's approval. ITS should also ensure that the EPMO Tool retains both historical and current information to allow for trending and analysis.

ITS should develop and document procedures to verify state agency data entered in the EPMO Project Portfolio Management Tool.

ITS should consider asking the General Assembly for the authority to ensure that ITS receives project status reports on schedule.

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IT Project List

The table below contains data for the 84 projects reviewed for this audit. The Project Portfolio Management (PPM) database contains data for 1,034 state IT projects, however baseline data was only available for 84 of those projects. The project data was extracted from the PPM database on October 4, 2012.

APPENDIX

		Gate 1			Planning and Design		Execution and Build	
Deparment or Agency	Project Name	Start Date	Estimated Budget	Estimated Project End Date	Estimated Budget	Estimated Project End Date	Revised/Actua 1 Budget	Estimated/Actual Project End Date
Dept. of Health and Human Services	Replacement MMIS DDI Project	11/1/2008	92,704,823	11/30/2011	92,704,823	11/30/2011	229,847,416	10/31/2013
Dept. of Revenue	Tax Information Management System (TIMS)	4/9/2007	525,000	12/31/2011	68,725,000	3/31/2012	97,345,877	1/31/2014
Dept. of Health and Human Services	NC FAST - Global Case Management and Food and Nutrition	7/1/2009	25,215,440	6/30/2012	48,218,500	3/29/2013	48,218,500	3/29/2013
North Carolina Turpike Authority	Toll Collection Management System (TCMS)	1/1/2010	19,800,000	7/1/2013	39,152,500	7/1/2013	41,110,539	5/30/2013
Dept. of Health and Human Services	Health Information System	9/15/2003	30,279,638	5/12/2013	26,426,610	6/30/2008	32,755,302	6/30/2011
Dept. of Health and Human Services	Crossroads State Agency Model Implementation Project	4/1/2009	22,470,196	11/30/2012	27,171,657	5/31/2013	30,442,392	6/30/2014
Office of the State Controller	Criminal Justice Data Integration Pilot for Wake County	10/1/2008	2,101,885	5/29/2009	2,295,344	10/16/2009	24,658,124	8/25/2012
Dept. of Transportation	Verizon Safety Automation and Electronic Sticker	2/1/2008	133,000	10/1/2008	16,752,000	10/1/2008	10,028,174	1/26/2009
Dept. of Health and Human Services	NC FAST Case Management Software Installation Project	11/1/2008	12,535,828	9/30/2009	12,542,533	9/30/2009	11,787,286	9/30/2009
Office of Information Technology Services	CGIA-NC Statewide Orthoimagery 2010	1/12/2010	5,514,700	6/29/2012	12,341,300	6/29/2012	12,160,556	7/20/2011
Office of State Budget and Management	Budget and Performance Management System (NC IBIS)	8/17/2009	6,495,430	7/29/2011	8,714,298	7/29/2011	9,764,663	7/31/2013
Dept. of Health and Human Services	NCMMIS+ Program – DHSR Business Process Automation	7/1/2008	6,669,636	6/30/2011	7,565,102	3/29/2013	8,565,102	3/29/2013
Dept. of Public Instruction	NC WISE Wave 3 Deployment	5/14/2007	32,740	6/30/2009	8,573,970	6/30/2009	7,315,943	9/30/2009
Dept. of Health and Human Services	DHHS Business Electronic Access Management (BEAM)	7/21/2010	5,506,545	12/31/2011	5,458,576	12/31/2011	7,012,571	4/30/2013
Dept. of Public Instruction	NC 1:1	7/18/2007	3,054,765	7/31/2009	5,557,559	7/31/2009	3,393,907	6/30/2010
Dept. of Transportation	Next Generation Secure Driver License System	2/12/2010	382,700	8/30/2012	4,685,650	10/31/2012	6,189,650	11/9/2013
Dept. of Health and Human Services	NC Electronic Disease Surveillance System (NC EDSS)	3/1/2004	4,460,000	9/30/2007	4,460,000	9/30/2007	4,622,376	7/21/2009
Employment and Security Commission	Initial Claims Call Center	7/1/2004	2,659,000	5/1/2006	2,659,000	5/1/2006	4,206,527	9/19/2009
Office of Information Technology Services	NCID Next Generation Upgrade	9/1/2008	3,207,414	9/30/2009	3,339,570	1/31/2011	3,958,383	3/18/2011
Office of Information Technology Services	Mainframe Software Toolset Consolidation	2/1/2010	4,150,885	4/15/2011	4,150,885	4/15/2011	4,150,623	1/11/2011
Dept. of Health and Human Services	NC FAST Automated Interview (AI) Integrator Select	2/1/2007	3,520,079	2/27/2009	4,026,680	6/30/2010	3,704,078	10/26/2010
Dept. of Public Instruction	CECAS 2.0	9/1/2009	1,998,879	6/30/2011	2,222,595	10/31/2011	3,242,108	6/30/2013
Dept. of Environament and Natural Resources	DWM UST Tank Information Management System (TIMS)	1/5/2009	490,476	12/31/2010	3,156,220	7/29/2011	3,160,391	12/14/2011
Dept. of Public Instruction	CEDARS - Data Warehouse	1/2/2008	4,511,117	11/30/2009	3,146,257	11/30/2010	3,012,001	5/5/2011
Dept. of Health and Human Services	Vital Records and Statistics Automation System	1/2/2001	2,227,862	7/1/2007	2,387,533	11/1/2007	2,523,215	1/28/2011
Dept. of Health and Human Services	Division of Medical Assistance - Uniform Screening	9/1/2006	2,398,877	9/30/2007	2,790,585	9/30/2008	2,968,303	9/30/2009
Office of Information Technology Services	Enterprise Monitoring	3/4/2008	1,667,402	4/24/2009	2,935,451	9/4/2009	2,705,603	12/16/2009
Dept. of Public Instruction	School Connectivity – Establish the K12 Common Net	8/2/2007	1,404,501	6/30/2008	1,404,618	7/31/2008	2,777,374	7/17/2009
Dept. of Crime Control and Public Safety	New Joint Force Headquarters - State Government	9/1/2009	3,194,347	9/30/2011	2,092,993	6/30/2011	2,679,258	7/11/2012
Dept. of Crime Control and Public Safety	Flood Inundation Mapping and Alert Network (FIMAN)	1/15/2007	2,942,744	6/27/2008	2,587,063	8/22/2008	2,010,930	9/14/2009
Dept. of Justice	Legal Services Case Management	11/1/2007	2,198,110	6/30/2009	1,571,411	10/29/2010	2,054,584	6/14/2012
Office of Information Technology Services	Email Archiving	5/25/2009	202,319	1/29/2010	2,305,911	8/31/2010	2,357,342	9/16/2010
Dept. of Health and Human Services	Division of Medical Assistance- Health Analytics I	1/4/2010	2,014,153	3/31/2011	2,113,451	8/31/2011	1,991,843	1/13/2012
Dept. of Corrections	Pharmacy Management System	8/8/2007	63,802	9/30/2008	1,997,843	6/30/2009	1,799,744	8/15/2009
Dept. of Transportation	Multi User Geodatabase (MUG, ITP.00181, ETS)	2/2/2009	634,570	3/31/2010	1,985,876	11/30/2011	1,799,731	11/11/2011
Dept. of Transportation	Asset Management System - Bridge Management	3/2/2009	1,966,060	4/1/2011	1,969,320	7/29/2011	1,941,103	7/15/2011
Dept. of Public Instruction	Computerized Instructional Management System (CIMS)	7/6/2010	1,836,703	1/31/2011	1,858,489	1/31/2011	1,846,277	4/15/2011
Office of Information Technology Services	Infrastructure Study & Assessment (INSA) Project	7/21/2010	2,212,612	4/29/2011	1,821,379	4/29/2011	1,854,804	5/10/2011
Office of Information Technology Services	Remote Office Backup Infrastructure	4/1/2009	680,228	10/9/2009	1,730,977	9/15/2010	1,758,309	10/28/2010
Dept. of Justice	Crime Data Integration (Captures)	4/16/2010	1,926,000	1/19/2012	1,703,472	8/30/2012	1,703,472	9/30/2013
Dept. of Public Instruction	CEDARS - Unique Identifier for the Education Community	9/3/2007	397,305	7/31/2008	1,626,506	8/31/2009	1,700,898	2/23/2010
Dept. of Public Instruction	AHR State Rollout	6/6/2008	242,212	12/31/2009	1,420,298	12/31/2010	1,518,679	6/13/2013
Dept. of Public Instruction	CEDARS - Reporting	7/9/2008	1,565,061	7/30/2010	1,145,555	5/31/2011	1,489,956	4/13/2012
Dept. of Transportation	Spatial Data Viewer (SDV, ITP.00182, ETS, P1)	2/2/2009	188,073	12/31/2010	1,456,960	10/31/2011	1,213,861	10/13/2011
Dept. of Transportation	Automated Routing and Permitting System Upgrade (ARPS)	7/14/2010	1,592,365	12/31/2011	1,425,938	4/30/2012	1,425,938	10/12/2012
Employment and Security Commission	UI Fraud & Identity Theft Detection (RECOVER)	2/1/2008	1,460,000	1/30/2009	1,281,255	5/29/2009	1,159,465	7/23/2009
Dept. of Transportation	Printing Project (ITP.00112, BSIP, P1)	3/2/2009	1,273,547	2/28/2011	1,273,574	11/28/2011	1,154,660	2/17/2012
Dept. of Public Instruction	CECAS Enhancement Phase 3	4/1/2008	1,147,031	6/30/2009	1,147,031	6/30/2009	1,173,115	12/5/2009
Employment and Security Commission	Southeast Consortium UI Modernization Feasibility	10/1/2009	2,085,227	11/30/2011	1,074,084	11/30/2011	788,833	1/24/2012
Office of Information Technology Services	Exchange Service Improvement Project	3/26/2010	1,066,081	7/29/2011	957,003	12/31/2010	1,046,770	9/14/2011
Office of Information Technology Services	Phase 2 ITAM	7/16/2007	500,754	10/31/2007	954,161	1/23/2009	993,016	3/16/2010
Dept. of Public Instruction	Grade 7 Online Writing	9/1/2008	681,060	6/30/2009	684,505	6/30/2009	894,656	6/4/2010
Dept. of Health and Human Services	DMH - HEARTS Upgrades - Precise ID	3/28/2008	861,225	5/1/2009	884,597	12/30/2009	882,307	9/22/2010
Dept. of Health and Human Services	Crossroads State Agency Model Planning Project	4/3/2006	1,187,220	6/30/2008	1,187,220	6/30/2008	899,183	6/20/2009
Dept. of Agriculture and Consumer Services	Agronomic LIMS	1/2/2009	650,757	2/8/2010	714,285	6/13/2011	887,628	7/18/2012
Dept. of Transportation	PCI Compliance (ITP.00199, IS)	3/15/2010	229,582	2/15/2011	858,812	7/31/2011	772,401	9/12/2011
Dept. of Transportation	DMV Driver License Digital Imagery System Planning	2/1/2008	846,000	2/28/2009	846,000	11/16/2009	745,500	4/13/2010
Dept. of Public Instruction	Computerized Instructional Management System (CIMS PILOT)	5/1/2008	546,809	6/30/2009	806,287	8/14/2010	819,797	7/14/2010
Office of Information Technology Services	GDPS - XRC Global Mirroring	2/15/2009	792,889	7/17/2009	811,018	1/8/2010	812,076	6/24/2010
Office of Information Technology Services	DNS Replacement 2010	4/5/2010	775,338	2/28/2011	811,256	6/17/2011	754,928	8/11/2011
Dept. of Commerce	Buildings & Sites Redesign	11/5/2007	593,336	3/6/2009	717,830	7/1/2009	744,064	5/10/2010
Dept. of Public Instruction	NC WISE eSIS 12.1 Upgrade	8/10/2009	741,617	2/28/2011	766,617	2/28/2011	467,916	2/19/2011
Dept. of Public Instruction	GMS 100 - Comprehensive Continuous Improvement Program	5/1/2009	765,681	6/30/2011	699,495	6/30/2012	761,638	10/31/2012
Dept. of Transportation	Grants Management (ITP.00196, BSIP, P1)	12/14/2009	743,714	6/30/2011	743,714	6/30/2011	757,996	6/7/2011
Dept. of Crime Control and Public Safety	Grants Enterprise Management System (GEMS) - GCC	5/4/2009	608,137	4/2/2010	596,660	3/31/2012	596,660	3/31/2012
North Carolina Turpike Authority	Construction Project Collaboration Software	2/11/2008	591,387	8/28/2009	591,387	8/28/2009	554,825	10/31/2009
Dept. of Transportation	DMV 2D Barcode (ITP.00174, DMV, P2)	10/15/2008	581,085	3/5/2010	549,496	8/27/2010	555,407	9/10/2010
Dept. of Public Instruction	CEDARS - Oracle Service Oriented Architecture	7/9/2008	509,982	5/15/2009	220,069	8/31/2009	560,683	3/18/2010
Dept. of Public Instruction	NCLTI State-Wide Expansion Evaluation	9/1/2008	540,679	9/1/2009	531,430	9/1/2009	521,426	3/27/2010
Dept. of Corrections	DCC Electronic Monitoring	3/17/2008	42,761	12/12/2008	482,291	7/15/2009	503,968	9/18/2009
Dept. of Health and Human Services	Electronic Pre-Assessment Screening Service	7/1/2010	479,857	12/13/2010	479,857	12/13/2010	430,025	8/9/2011
Dept of Agriculture and Consumer Services	Veterinary LIMS Project	12/15/2009	366,067	7/19/2011	446,067	10/31/2011	292,585	11/16/2011
Dept. of Public Instruction	Child Nutrition CRE	9/17/2007	17,752	8/15/2008	394,708	11/28/2008	417,782	12/28/2009
Dept. of Transportation	DMV Central Issuance Lite (ITP.00152, DMV, P3)	3/15/2008	7,491,333	3/31/2009	409,176	6/30/2009	345,705	10/7/2009
Office of Information Technology Services	Firewall/VPN - Service Refresh & Customer Migration	1/5/2009	25,573	7/31/2009	395,292	12/1/2010	402,286	6/17/2011
Office of State Personnel	E-Recruit Project	10/28/2010	319,880	8/31/2011	364,565	1/17/2012	300,325	1/9/2012
Dept. of Transportation	DMV Unified Carrier Registration - Phase 2	3/24/2008	356,330	9/30/2009	356,330	3/31/2010	311,500	4/4/2010
Office of Information Technology Services	Project Management/Resource Management Tool	2/11/2009	343,060	8/14/2009	281,785	8/14/2010	262,234	8/12/2010
Office of Information Technology Services	Voice Mail Replacement - Lease	2/26/2010	145,116	11/12/2010	162,180	3/31/2011	244,577	11/9/2011
Dept. of Environament and Natural Resources	DPR Central Reservation System	4/2/2007	144,002	6/1/2008	165,118	2/28/2010	168,803	5/28/2010
Office of Information Technology Services	Office Printer Copier Device Management	8/10/2007	100,200	12/31/2007	148,116	9/30/2009	182,797	11/2/2009
Dept. of Public Instruction	School Connectivity - Implement the NCDPI Network	4/23/2008	177,425	6/30/2009	122,115	8/31/2009	123,790	8/31/2009
Dept. of Public Instruction	Child Nutrition System Server and OS Upgrade	10/16/2009	69,712	7/30/2010	56,130	12/15/2010	56,271	11/7/2011
Employment and Security Commission	UI Appeals Hosted Service for the Integration of Digial	6/11/2009	52,900	3/31/2010	57,099	9/30/2010	60,561	8/21/2010
	Total		**319,886,588**		**478,406,873**		**676,181,872**	

State of North Carolina
Office of Information Technology Services

Pat McCrory
Governor

Chris Estes
State Chief Information Officer

March 26, 2013

The Honorable Beth A. Wood, CPA
Office of the State Auditor
2 South Salisbury Street
20601 Mail Service Center
Raleigh, North Carolina 27699-0601

Dear State Auditor Wood:

We have reviewed the February 15, 2013, confidential draft of the audit entitled "Office of Information Technology Services IT Project Budget and Schedule Variances" based on your field evaluation completed October, 2012, during the previous administration. We agree with the findings and thank you for providing recommendations to improve IT project management in the State of North Carolina.

ITS is making plans to begin addressing these issues and others in the management of information technology. These initiatives will be included in the Statewide IT Plan, which will be completed by October 1. Successful implementation is dependent on funding.

Our specific responses to the Findings and Recommendations are as follows:

1. Actual Costs And Schedules Differ Significantly From Original Estimates

Recommendation: ITS should develop and publish written guidance for developing state agency IT project cost and schedule estimates. The guidance should also describe the education, experience, and credentials needed by the personnel who develop the estimates.

ITS Response: We agree and will work with the Office of State Budget and Management and executive branch agencies to update and enhance existing documentation, and to provide improved guidance on cost and schedule estimates. If funding can be obtained, we will establish business case and cost estimation training for state employees. We will work with the Office of State Personnel to develop a project management skills inventory and a career path for project managers.

Recommendation: ITS should require state agencies to obtain independent validation of the accuracy and reasonableness of IT project estimates. Alternatively, ITS should require agencies to submit appropriate and adequate documentation so that ITS can evaluate and determine the accuracy and reasonableness of agency estimates.

P.O. Box 17209, Raleigh, NC 27619-7209
4101 Mail Service Center, Raleigh NC 27699-4101
Telephone: 919-754-6100

ITS Response: We agree and will work with the State Budget Office to establish additional guidance and oversight in the development of project cost estimates. We will also help agencies provide appropriate and adequate financial documentation.

Recommendation: ITS should request that the General Assembly consider enacting a state law to hold state agency managers accountable and require them to meet IT project cost and schedule estimates.

ITS Response: We understand the concern over contracts being signed before cost estimates are finalized, and will modify the project review process to address that concern using our existing statutory authority. A possible solution is to add an "award approval" step. Before new legislation is requested, a possible solution is better reporting and enforcement of existing law.

2. Procedures Do Not Ensure Complete, Accurate, And Timely Data

Recommendation: ITS should develop and document a method to identify state agency IT projects that require the SCIO's approval. ITS should also ensure that the EPMO Tool retains both historical and current information to allow for trending and analysis.

ITS Response: We agree with this recommendation and will better define and communicate to agencies projects that require SCIO approval.

We agree that a PPM tool should retain data necessary to provide trending and analysis data, but must weigh the additional cost versus the benefit. ITS is implementing new software that may have the ability to provide long-term data.

Recommendation: ITS should develop and document procedures to verify state agency data entered in the EPMO Project Portfolio Management Tool.

ITS Response: We agree and will provide agencies with additional guidance and / or training to ensure that they are following procedures to verify state agency data entered into the EPMO Project Portfolio Management Tool.

Recommendation: ITS should consider asking the General Assembly for the authority to ensure that ITS receives project status reports on schedule.

ITS Response: We agree that agencies should provide timely project status reports and believe this is within our existing statutory authority. Going forward, we will use this authority to ensure timely status updates. For example, we can use existing authority to suspend or stop projects that are out of compliance.

Thank you again for the opportunity to respond to the draft audit. ITS looks forward to working with the Office of State Auditor and others to improve the efficiency and effectiveness of information technology in delivering services to the state's citizens.

Sincerely,

Chris Estes

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This audit required 2,472 audit hours at an approximate cost of $198,987. The cost represents less than 1% of the $676 million in total expenditures subjected to audit.