



STATE OF NORTH CAROLINA

PERFORMANCE AUDIT

DEPARTMENT OF HEALTH AND HUMAN SERVICES

NCTRACKS (MMIS REPLACEMENT) - IMPLEMENTATION

MAY 2013

OFFICE OF THE STATE AUDITOR

BETH A. WOOD, CPA

STATE AUDITOR

EXECUTIVE SUMMARY

PURPOSE

This audit was conducted to determine whether the Department of Health and Human Services has properly tested its new Medicaid computer system before it goes live on July 1, 2013. Auditors also reviewed the access security of the system.

BACKGROUND

The Department is replacing its 25-year-old Medicaid Management Information System (MMIS). The replacement system – NCTracks – has been in the works for the past 4½ years. NCTracks will process and pay more than \$12 billion a year in health care claims for 70,000 enrolled medical providers who serve 1.5 million people in North Carolina. The Department has been conducting the final readiness tests for the past eight months. The audit period covered August 29, 2012, through March 16, 2013, the period between the start and rescheduled end dates of the main final testing phases. The audit fieldwork was conducted from February 11, 2013, to March 18, 2013.

KEY FINDINGS

- The Department has failed to fully test the system, and the production testing process had flaws.
- Key decisions about the addition of 1,500 user accounts and privacy and security procedures have yet to be made, increasing uncertainty about project readiness.
- A vendor hired to oversee the project did not conduct independent verifications as expected by the federal agency that administers Medicaid, and another vendor was permitted to set its own guidelines for whether its work was acceptable.
- No formal criteria exists to determine whether the new system is ready to go-live.

KEY RECOMMENDATIONS

- The Department should determine where gaps in testing exist and develop a plan to address them before go-live.
- Key decisions regarding the access control and security environment need to be made before July 1, 2013.
- The Department should review the work of vendors to ensure it will allow the State to receive proper certification from the federal Centers for Medicare and Medicaid Services.
- The Department should develop an official go-live criteria framework.

ADDITIONAL INFORMATION

The Department's responses indicate it has mitigated or is working to mitigate the risks identified in this report before the July 1 implementation date. The complexity of the NCTracks system makes it impossible to predict all of the scenarios that could impact the project, even after it is tested in accordance with industry best practices.

Key findings and recommendations are not inclusive of all findings and recommendations in the report.

Office of the State Auditor



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>

May 22, 2013

The Honorable Pat McCrory, Governor
Members of the North Carolina General Assembly
Mr. Chris Estes, State Chief Information Officer
Dr. Aldona Wos, Secretary, Department of Health and Human Services
Mr. Joseph Cooper, Jr., Chief Information Officer, Department of Health and Human Services
Ms. Angeline Sligh, Director, Office of Medicaid Management Information System Services

Ladies and Gentlemen:

We are pleased to submit the results of our performance audit of information technology controls titled *Department of Health and Human Services, NCTracks (MMIS Replacement) - Implementation*.

On July 1, 2013, the North Carolina Department of Health and Human Services is scheduled to transition and go-live with NCTracks – the new replacement Medicaid Management Information System. The audit objectives were to determine (a) whether the pre-implementation user acceptance testing and production simulation testing of the new system was adequate and sufficient and (b) if the Department established access controls in NCTracks that meet statewide security standards.

The Office of the State Auditor initiated this audit to identify improvement opportunities for NCTracks prior to go-live.

The Department was presented in advance with the findings and recommendations on March 27, 2013, and reviewed a draft copy of this report. The Department's written comments are included in the appendix.

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

Respectfully submitted,

A handwritten signature in cursive script that reads "Beth A. Wood".

Beth A. Wood, CPA
State Auditor

TABLE OF CONTENTS

	PAGE
INTRODUCTION	
BACKGROUND	1
OBJECTIVES, SCOPE, AND METHODOLOGY	2
FINDINGS AND RECOMMENDATIONS	
1) CRITICAL USER ACCEPTANCE TESTS NOT EXECUTED	4
2) PRODUCTION SIMULATION TESTING PROCESS FLAWED.....	8
3) INDEPENDENT ASSESSMENTS ARE FLAWED.....	11
4) ACCESS CONTROL AND SECURITY ENVIRONMENT AT RISK ON GO-LIVE.....	17
5) NO FORMAL CRITERIA EXISTS TO DETERMINE GO-LIVE READINESS	18
APPENDICES	
A. CRITICAL PRIORITY TEST CASES NOT EXECUTED	21
B. A BRIEF TIMELINE: REPLACING THE NORTH CAROLINA MEDICAID MANAGEMENT INFORMATION SYSTEM (2004-2014)	22
C. NCTRACKS PRE-IMPLEMENTATION SCHEDULE.....	23
D. NCTRACKS VENDORS AND OVERSIGHT ENTITIES	24
E. LIST OF KEY TERMS USED IN THIS REPORT	25
F. DEPARTMENT RESPONSE	26
G. ITS RESPONSE.....	34
ORDERING INFORMATION	36

BACKGROUND

On July 1, 2013, the North Carolina Department of Health and Human Services (the Department) is scheduled to transition and go-live with NCTracks – the replacement system for the Medicaid Management Information System. The State’s current Medicaid Management Information System (MMIS) has operated since 1988, when it was purchased from HP Enterprise Services. NCTracks is a multi-payer system that will facilitate provider enrollment, consolidate claims processing activities, and support healthcare administration for multiple divisions of the Department. NCTracks will process and pay more than \$12 billion a year in health care claims for about 70,000 medical providers who serve approximately 1.5 million North Carolina citizens.

This new system was designed and developed based on a \$265 million contract awarded to Computer Sciences Corporation (vendor or CSC) in December 2008. Initially, the contract established a fully implemented go-live date of August 2011 for the new system. However, in July 2010, the vendor notified the Department that it would not be able to meet the established go-live date and requested an extension. After lengthy negotiations, the Department approved a contract amendment in July 2011 that granted an 18-22 month extension to build the system, increased the contract price from \$265 million to \$484 million, and extended the operational contract an additional two years to 2020.

In December 2012, the Department approved a third contract amendment that changed the targeted system operational readiness date from February 28, 2013, to July 1, 2013. This initial readiness date, by which the new system was set to be operational as a whole and capable of generating official data, was changed to accommodate various legislative and regulatory mandates that arose after May 31, 2012. Per the amendment, the vendor will achieve operational readiness only after the State has accepted the final milestone or deliverable for the design, development, and installation phase of the project, and after user acceptance testing and production simulation testing have been completed to the State's reasonable satisfaction.

The Department’s Office of Medicaid Management Information System Services (OMMISS) is responsible for providing central oversight of the NCTracks implementation and managing activities and vendors involved in the development and testing of the new system.

The federal government currently funds up to 90% of the costs associated with NCTracks. Once it goes live, the federal government is expected to pay 50% of its operational costs. This percentage would increase to 75% if the system is certified by the federal Centers for Medicare and Medicaid Services (CMS). Per the existing contract, the vendor is expected to assist the State in achieving federal certification for NCTracks within one year of the operational start date.

North Carolina contracts with HP Enterprise Services to operate the State’s MMIS, the existing Medicaid claims payment system. On February 28, 2013, the Department gave HP notice of termination of this contract effective July 7, 2013, having found that termination of the contract will serve the best interests of the State.

A list of key terms and definitions used in this report and additional background material are included in the appendix to assist the reader in understanding the NCTracks environment.

OBJECTIVES, SCOPE, AND METHODOLOGY

The audit objectives were to determine if the pre-implementation user acceptance testing (user testing or UAT) and production simulation testing (production testing or PST) of the new system were adequate and sufficient, and whether the Department had established access controls in NCTracks that meet statewide security standards. The core questions for user testing and production testing included:

- Were all of the original user and production tests performed?
- Are testing results valid?
- Were any key testing processes omitted?

The Office of the State Auditor initiated this audit as part of an effort to examine and identify, prior to go-live, key improvement opportunities for NCTracks.

The audit scope included a review of the main pre-implementation user and production testing phases and their results and a review of NCTracks access control policies and procedures. The audit period covered August 29, 2012, through March 16, 2013, the period between the start and rescheduled end dates of the main user and production testing phases. Fieldwork was conducted from February 11, 2013, to March 18, 2013.

To accomplish the user and production testing audit objectives, auditors gained an understanding of the NCTracks testing plans and procedures, interviewed Department administrators, interviewed Division of Medical Assistance, Division of Mental Health, and Division of Public Health personnel, and individual testers, reviewed appropriate technical literature, and inspected computer-generated test case reports. Auditors also performed a gap analysis to identify whether existing user acceptance and production simulation testing activities were sufficient to achieve key control objectives specified by the COBIT 5 framework.¹

To accomplish the access control audit objectives, auditors gained an understanding of NCTracks access control policies and procedures currently in place and planned for go-live, interviewed key system administrators at the Department and CSC and other personnel, examined projected system configurations, and reviewed appropriate technical literature.

To gain an understanding of the overall project management and oversight processes for the development and implementation of the new system, vendors and key personnel at the Department and at the State's Enterprise Project Management Office were interviewed. Auditors also reviewed organizational charts, reviewed vendor contracts, analyzed monthly and weekly vendor reports, and used the state's project portfolio management (PPM) tool.

As a basis for evaluating user testing and production testing, guidance contained in the COBIT 5 framework issued by ISACA was applied. COBIT 5 is a comprehensive framework that assists enterprises in achieving their objectives for the governance and management of enterprise information and technology assets (IT). This framework helps enterprises create optimal value

¹ A comprehensive framework that assists enterprises in achieving their objectives for the governance and management of enterprise information and technology assets.

PERFORMANCE AUDIT

from IT by maintaining a balance between realizing benefits and optimizing risk levels and resource use. COBIT 5 enables IT to be governed and managed in a holistic manner for the entire enterprise, taking in the full end-to-end business and IT functional areas of responsibility, considering the IT-related interests of internal and external stakeholders.

As a basis for evaluating general access controls, the guidance contained in *The State of North Carolina Statewide Information Security Manual*, which provides the foundation for information technology security for North Carolina state agencies, was used. It sets out the standards required by G.S. §147-33.110, which directs the State Chief Information Officer to establish a statewide set of standards for information technology security to maximize the functionality, security, and interoperability of the State's distributed information technology assets. The security manual sets forth the basic information technology security requirements for state government.

This performance audit was conducted in accordance with generally accepted government auditing standards. Those standards require that auditors plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for findings and conclusions based on the audit objectives. The Office of the State Auditor believes that the evidence obtained provides a reasonable basis for the findings and conclusions based on the audit objectives.

This audit was conducted under the authority vested in the State Auditor of North Carolina by *North Carolina General Statute §147.64*.

FINDINGS AND RECOMMENDATIONS

FINDING #1: HUNDREDS OF CRITICAL USER TEST CASES WERE NOT EXECUTED

User Acceptance Testing (UAT): A key subphase of testing that provides DHHS users the opportunity to test, review, and accept system components. The overall goal of UAT is to demonstrate that NCTracks meets the detailed functional requirements and specifications of the business processes.

NCTracks has not been fully tested to confirm that it can produce and support the most critical business functions:

- (1) All critical priority test cases were not executed
- (2) All key user role test cases were not fully executed
- (3) Integrated test documentation does not exist

If user acceptance testing is accepted without addressing these issues, a high risk exists that critical NCTracks functions could have major errors on go-live and possibly lead to a delayed CMS certification of the system.

The Department did not provide adequate oversight during user testing. By failing to track and ensure that all critical priority test cases were executed, the Department lacks sufficient information to assess whether NCTracks meets the requirements of its users.

The *State of North Carolina Statewide Information Security Manual*, states that Agencies shall develop a process to ensure that new systems and equipment are fully tested and formally accepted by users before management accepts the systems and places into the operational environment.²

The *ISACA COBIT 5 Framework* states that organizations should undertake all tests in accordance with the test plan,³ that the test plan reflects an assessment of risk, and that all functional and technical requirements are tested.⁴

Not All Critical Priority Test Cases Were Executed

During user acceptance testing that began on August 29, 2012, and ended on the rescheduled date of March 1, 2013, all 834 critical priority test cases that had been planned were not executed. As a result, at the completion of the main testing phase, the pass/fail status of 285 critical test cases was unknown.

The types of critical priority test cases that were not executed involved various Department business process categories, including: Rx claims, provider, recipient, financial, managed care, and medical claims. See *Appendix A* for a breakdown on the number and types of critical test cases not executed.

² Section 050104, Testing Systems and Equipment

³ Management Practice BAI03.08, Execute Solution Testing

⁴ Management Practice BAI07.03, Plan Acceptance Tests

FINDINGS AND RECOMMENDATIONS

Shortly after user testing began, the Department determined that it would not be able to execute all the test cases that had been developed as testing proceeded slower than expected due to various complexities, such as:

- UAT testers having to assume the role of a provider and input their own data
- Data mining was insufficient for the Division testers
- User role access issues prevented proper access to testing
- Changes to test data required testers to re-start tests
- Not all test functionality was available

As a result, the Department decided to assign priorities to all test cases and focus on those cases that were most critical (i.e., Priority 1 and 2). However, the Department did not track and did not assess the actual execution of critical test cases. Instead, the Department focused primarily on the reporting and assessment of test defects in order to meet UAT acceptance criteria.

According to the Department, test cases assigned a Priority 1 or 2 were absolutely required to be tested and were thus considered “Critical” test cases. UAT testers and key personnel throughout the Department indicated that they were not aware that test cases had been assigned a priority.

The methodology used by the Department to establish this approach consisted of five priorities, which were poorly defined as there was no clear distinction among the first three priority definitions.

UAT Test Case Priority Definitions Used by the Department	
Priority 1	Most critical test cases; those to be tested in Round 1 of testing. These test cases would include items that must be tested to confirm that the system can produce/support the most critical functions.
Priority 2	These are critical test cases; those to be tested in Round 2 of testing. These test cases would include items that must be tested to confirm that the system can produce/support the critical functions.
Priority 3	Less critical test cases; those to be tested in Round 3 of testing. These test cases would include items that must be tested to confirm that the system can produce/support the critical functions.
Priority 4	The test cases in this ranking would be those that would be tested as time permits.
Priority 5	These test cases are essentially duplicate test cases and there would be no need to test these at all.

NCTracks User Roles Not Fully Tested and Key Tests Failed

During the User Acceptance Testing (UAT) phase that began August 29, 2012, and ended on the rescheduled date of March 1, 2013, not all of the user roles that will be part of the NCTracks system on go-live were tested. If the Department does not address this issue before go-live, there is a high risk that users will not have the appropriate access needed to do their jobs.

At the time of this audit, the likelihood of this type of complication to occur is high based on the feedback of various UAT testers who encountered user role access issues while conducting tests and assessing the system for the first time. Complications with user role access could lead

FINDINGS AND RECOMMENDATIONS

system administrators and authorizing managers to bypass internal controls by granting “super-user” access to process claims.

The NCTracks system will use a new security approach that incorporates Role Based Access Control (RBAC), which means that all NCTracks users will obtain access to the new system based on assigned “user roles” tied to their job functions.

At the end of user testing, February 22, 2013, a test case report showed that many of the NCTracks user role test cases were not executed. On March 22, 2013, an updated test case report showed that user role test case statistics had not changed. User Acceptance Test reports also show that user role test cases were not assigned a priority even though all test cases were supposed to have received one.

Status of NCTracks “User Role” Test Cases as of February 22nd			
Type of User Role Test Case	Total Number of Test Cases	Number of Test Cases “Not Executed”	Number of Executed Test Cases in “Failed” Status
“Role Provisioning”	94	78	13
“Role Validation”	48	32	3
“Fiscal Agent User Access”	78	78	n/a
“Adding And Removing Roles To An Existing State User”	109	63	11
Source: SILK computer-generated report			

Analysis at the end of the user acceptance testing phase also indicates that three key user role test cases were performed but failed the test:

- Adding a New State User - With Valid State NCID
- Terminate a State User
- Create New User - Individual Currently Enrolled Provider

During interviews with UAT testers from different DHHS divisions, testers indicated that user role access issues were encountered while conducting tests and assessing the NCTracks system for the first time. This issue was documented in the UAT Lessons Learned file that the Department created after the user acceptance testing period ended March 1, 2013. In the document, the Department identified user provisioning as a problem that “impacted what the users could access.” In the Lessons-Learned document, the feedback from DHHS division users included:

- *“Role definitions were not set for the users to do the testing they needed to accomplish.”*
- *“Users need to be assigned the correct roles...Divisions need a process to define the roles that are needed.”*
- *“Roles may not have been sufficiently tested by the divisions.”*

FINDINGS AND RECOMMENDATIONS

- *“Concern that they [users] are testing parts of the system without the appropriate roles. Users think that they needed superuser [access] just to complete their testing and avoid any problems.”*
- *“Divisions may need to test more security roles.”*

Lack of Integrated Documentation To Ensure All Requirements Were Tested

The Department cannot show whether NCTracks will function in accordance with system requirements in a manner to meet business requirements. The Department does not have integrated documentation that shows that all NCTracks functional requirements were tested. Overall, test documentation exists but is not linked or integrated clearly to NCTracks requirements. Lacking integrated documentation risks substantial system errors that could delay federal CMS certification. Without a detailed analysis of which requirements were not tested, it is difficult to determine the actual impact.

The Department confirmed that integrated documentation is not a goal of user acceptance testing. However, the NCTracks Master Test and Quality Assurance Plan (MTQAP) states that UAT test cases are to be “written to assure, via the RTM, that each requirement listed is tested and functionality successfully verified.”

User acceptance testing focused on linking business processes, rather than functional requirements, to test cases. The Department uses a master requirements traceability matrix (RTM) to trace NCTracks requirements to Department business processes. The Department uses technical design documents that link business processes to each of the system builds.⁵ Test cases from previous phases, such as build system integration testing, were mapped to requirements. Test cases for user acceptance testing, however, are mapped to business processes and not back to the NCTracks requirements. These documents are not integrated and cannot be used to easily trace NCTracks requirements directly to their associated user acceptance test cases. As a result, the Department’s documentation approach does not allow one to assure that each requirement was tested and that its functionality has been successfully verified.

Recommendations:

1. The Department should review the high priority test cases that were not executed and assess against the “Gap List” that will be used to determine and schedule test cases during the user acceptance testing in May.
2. The Department should develop, prior to go-live, a comprehensive user acceptance testing “scheduled vs. not executed” test case report and this report should be available to all department NCTracks stakeholders.
3. The Department should test, during the user acceptance testing in May, all NCTracks user role test cases that have not been executed.
4. A report that shows the status of all user role test cases should be developed and shared with all the authorizing managers of the new system prior to go-live.

⁵ NCTracks was developed based on an iterative design, which included 15 unique builds that were tested individually.

FINDINGS AND RECOMMENDATIONS

5. NCTracks accounts for Department users should be created with enough time prior to July 1, 2013, to allow all the new system users to view and test their own level of access and request necessary adjustments.
6. The Department should continue to work with providers to ensure that they understand the user role and access control process on go-live.
7. The Department should integrate, in a traceable manner, all the documents about NCTracks requirements, business processes, test builds, and test cases.
8. Once requirements are linked to test cases, the Department should re-evaluate user acceptance testing results to assess whether or not all NCTracks functional requirements were tested.

FINDING #2: PRODUCTION SIMULATION TESTING PROCESS FLAWED

Production Simulation Testing (PST): The final subphase of testing, the overall goal of PST is to demonstrate that the NCTracks system is ready to support production operations.

Serious flaws exist in the production testing process that began on August 29, 2012, and ended on the rescheduled date of March 16, 2013.

- (1) Acceptance criteria for NCTracks was not established before production testing
- (2) The vendor building NCTracks developed the acceptance criteria
- (3) A detailed and integrated test plan with test benchmarks was not created
- (4) The severity of test defects identified was not reviewed and assessed jointly with the vendor.

Inadequate oversight of production testing by the Department risks the readiness of NCTracks to fully support production operations. As a result of not having a defined test plan and testing acceptance criteria, the Department relied solely on the vendor. This increases the risk that the Vendor underreported the severity of defects to meet acceptance criteria and could lead the Department to inadequately assess the overall production system testing and encounter issues on go-live.

No Established Acceptance Criteria Before Vendor Began Testing

Acceptance Criteria: Defines the requirements that must be met before the Agency agrees that the vendor has successfully completed their contractual obligations for a project phase.

The Department did not have formal criteria in place to accept the system for production before CSC (the vendor) began testing. By not having any criteria in place before testing, there is a risk that criteria developed later would align with the test results rather than production requirements.

Production testing began on August 29, 2012, and ended on the rescheduled date of March 16, 2013. Formal acceptance criteria for production simulation testing was not established until the last week of the testing phase.

FINDINGS AND RECOMMENDATIONS

The *ISACA COBIT 5 Framework* states that organizations should “Ensure that the test plan establishes clear criteria for measuring the success of undertaking each testing phase. Consult the business process owners and IT stakeholders in defining the success criteria.”⁶

Acceptance Criteria Was Proposed by the Vendor

The Department created a conflict of interest for CSC (the vendor), by asking the vendor to propose the acceptance criteria for production testing. This conflict risks the credibility of test results and operational readiness of the system to go-live.

The conflict exists because the vendor built the system, tested it, and proposed the criteria for the Department to accept the system’s production readiness. Contracting agencies normally develop acceptance criteria in consultation with business process users.

Formal acceptance criteria for production testing was proposed and submitted by the vendor to the Department on March 6, 2013. The criteria proposed was reviewed and accepted by the Department without any major modification. A review of the acceptance criteria showed that it contained those activities that CSC had reported to the Department throughout production testing.

Lack of Clear Test Benchmarks

Clear benchmarks to measure test results were lacking because the Department did not have a fully defined test plan for production simulation testing. According to the Department, a formal test plan was not established as it was not considered a contract deliverable.

By not having an integrated test plan with easily accessible documentation on the benchmarks used to assess the various types of tests conducted, the Department cannot show what test success was measured against. As result, it is difficult to assess whether the NCTracks system is fully ready to support production operations.

Two documents⁷ developed by the vendor provided the name and a general description of 11 types of tests that were to be conducted during production testing. However, these documents did not contain details about the specific tests included under each test type nor did they contain any benchmarks for success. Furthermore, the names of the 11 test types did not always match the vendor test reports.

The Department noted that even though there was no clear documentation that showed what the testing benchmarks were, they believed that CSC (the vendor) was properly assessing NCTracks because the vendor would be the main user.

During the audit, auditors asked for the benchmarks used to assess the various production simulation tests. The Department indicated that some of the benchmarks were based on the

⁶ Management Practice BAI07.03, “Plan Acceptance Tests”

⁷ The two main sources of documentation that described production testing activities were developed by the vendor. This documentation included a high-level Master Test and Quality Assurance Plan (MTQAP or test plan), updated in November 2012, and a PowerPoint presentation called “PST Preparation Activities”, delivered in July 2012.

FINDINGS AND RECOMMENDATIONS

contract and the service level agreement that they had established with CSC, and as a result, the benchmarks were not easily accessible.

Vendor test reports do not explain or provide any information as to what the benchmarks were for each type of test. The only exception auditors found were the comparative claims tests, which do provide a clear benchmark to measure the success of pharmacy and dental comparative claims.

The *ISACA COBIT 5 Framework* states that organizations should “Create an integrated test plan that will enable the creation of suitable testing and simulation environments to help verify that the solution will operate successfully in the live environment and deliver the intended results and that controls are adequate.”⁸ The Framework further states that organizations should “Ensure that the tests and anticipated outcomes are in accordance with the defined success criteria set out in the testing plan.”⁹

Inadequate Oversight of the Severity Classification of Test Defects

Test defect: A term used if discrepancies exist between the predicted test results and the actual test results.

Test severity level: A priority code assigned to a test defect that alerts staff to the relative need of immediate action to correct the defect.

During the production simulation testing that began on August 29, 2012, and ended on the rescheduled date of March 16, 2013, the Department did not review and assess jointly with CSC (the vendor) the severity of test defects identified during testing. When asked why this type of oversight was not in place, the Department indicated it planned to review and assess the overall production simulation testing phase once it was fully completed.

During production testing, identified test errors were tracked by the vendor as defects and classified using one of five severity levels. Overall, test defects were classified with a severity level and managed through resolution by the vendor without any assessment from the Department.

The vendor did provide the Department with weekly dashboard reports and comprehensive status reports at the end of each of the four production testing cycles. However, other than receiving and reviewing these formal status reports, which included statistics on the number of defects and their severities, the Department did not participate in assessing and establishing the severity classifications or manage the processing of testing defects.

The *ISACA COBIT 5 Framework* states that organizations should “Review the categorised log of errors found in the testing process by the development team, verifying that all errors have been remediated or formally accepted,” and “Identify, log and classify (e.g., minor, significant, mission-critical) errors during testing. Repeat tests until all significant errors have been resolved. Ensure that an audit trail of test results is available. Communicate results of testing to

⁸ Management Practice BAI03.07, Prepare for Solution Testing

⁹ Management Practice BAI07.05, Perform Acceptance Tests

FINDINGS AND RECOMMENDATIONS

stakeholders in accordance with the test plan to facilitate bug fixing and further quality enhancement.”¹⁰

Recommendations:

1. The Department should develop documentation that clearly identifies the benchmarks for tests conducted during the production simulation testing phase.
2. The Department should evaluate final production simulation test results against benchmarks.
3. The Department should revisit the current acceptance criteria for the production simulation testing phase and receive formal approval by the NCMMIS+ Program Steering Committee.
4. The Department should assess final production simulation test results against the revised production simulation testing acceptance criteria.
5. As part of the production simulation testing deliverable review, the Department should conduct a review of all open test defects and their assigned severities before production testing is accepted.

FINDING #3: INDEPENDENT ASSESSMENTS ARE FLAWED AND PUT SYSTEM READINESS AT RISK

During the user acceptance testing and production simulation testing phases, Maximus, the independent verification and validation (IV&V) services vendor, relied exclusively on the test result reports of other vendors to conduct its own test case analysis. By relying on other vendors, Maximus did not minimize system implementation risks as required by the federal Centers for Medicare and Medicaid Services (CMS).

In addition, the state’s Enterprise Project Management Office (EPMO) has not assessed the NCTracks project properly as a result of having: (1) inflexible project indicator guidelines, and (2) a weakness in its project portfolio management tool. By consistently rating the overall NCTracks project as “Green”, even though it has warranted “Yellow” ratings at times, EPMO has increased the perception that this project has no issues or risks as it nears go-live.

¹⁰ Management Practice BAI07.05, Perform Acceptance Tests

FINDINGS AND RECOMMENDATIONS

Questionable Oversight of UAT and PST by the Independent Verification and Validation (IV&V) services Vendor

Independent Verification and Validation (IV&V) Contractor: “Conducts IV&V Assessments. Technically, managerially, and financially independent of any party affiliated with the business application or infrastructure being tested. Identifies potential improvements or identifies problems before they occur.” -CMS

During the user acceptance testing and production simulation testing phases, Maximus, the independent verification and validation (IV&V) vendor, relied exclusively on the test results reports of other vendors to conduct its own test case analysis. By relying on the test result reports of other vendors, Maximus did not help minimize system implementation risks as required by the Centers for Medicare and Medicaid Services (CMS).

The Department’s approval and justification memo in support of a contract for independent verification and validation services, written in 2009, states, “CMS requires [IV&V] services and requests that they be performed by an independent vendor to help minimize system implementation risks and facilitate a successful implementation and the required CMS certification for the MMIS.” By not conducting independent verification and validation analysis during the user and production testing phases, Maximus was not aware of key issues regarding the testing environment.

To report on user and production testing, Maximus requested and used reports from SLI, the test management services vendor, to analyze user testing and used CSC reports to analyze production testing. According to Maximus staff, they do have access to SILK, the test repository tool in which they can conduct independent user test case analysis and production test defect analysis, however, they do not use it as it has a “limited capability” for them.

To the contrary, the SILK tool provided valuable insight into the actual status of each test case. For example, basic analysis using SILK showed that as of February 22, 2013, there were more than 2,000 test cases that were in a “Not Scheduled” category and had not been executed. When informed about this, Maximus was not familiar with the “Not Scheduled” category or the number of test cases in it. Additionally, when asked about the priority of several test cases, Maximus staff indicated that they were not aware that user test cases had been assigned priorities.

The North Carolina Enterprise Project Management Office (EPMO) Director, to whom the Maximus staff reports, acknowledged that Maximus relies exclusively on the reports of other vendors to conduct its own test case analysis. EPMO indicated that the only way Maximus could have done an independent test case analysis during the user and production testing phases would have been if EPMO had asked for one, which it did not request, as it would have required additional financial and personnel resources. The last time that EPMO requested an independent “ad-hoc report” was in 2012, when Maximus conducted a user acceptance testing readiness assessment to determine if all factors required for the successful launch of user testing had been met or were in place. The next formal independent review that EPMO is expecting Maximus to conduct is a review of the CSC final user and production testing contract deliverables, to take place in March and April.

FINDINGS AND RECOMMENDATIONS

A review of the Maximus contract found that it did not specify test activities that Maximus was to independently verify and validate during the user acceptance testing and production simulation testing phases. According to the contract objectives and technical duties identified in *Section 1.3 and 1.8* of the RFP:

“The State expects the vendor to perform technical, business and process reviews under the Contract, providing continuous, on-site monitoring and assessment of development and project management activities performed under the development contracts. As stated in Section 1.3 of the RFP, the Vendor shall not lead nor perform independent, broadbased test management activities (leading/performing the planning, execution, and reporting of system/user testing); however, the monitoring and auditing of test activities, and targeted testing for specific assessments, if proposed by the Offeror in its solution, shall be considered. At a minimum, the Vendor shall perform the following IV&V activities for each project within the NCMMS+ Program [among other things]:

- Perform process and management-level assessments to identify deviations from established plans and processes”

The independent verification and validation (IV&V) plan developed by Maximus also noted that statement and indicated “However, the IV&V Team will conduct IV&V monitoring and high-level auditing of test management activities, as well as conduct targeted testing for claims payment accuracy.”

In the IV&V Plan, there is also a Testing Checklist that serves as “a tool that will be customized for the IV&V Team to use through the various phases of testing to help ensure that testing activities have been finished, reviewed, and signed off so that tested software is ready for implementation.” Two key items contained in this checklist include “Adequacy” (i.e., is the testing adequate to verify the functionality of the software product?) and “Verifiability/Testability” (i.e., has the necessary testing been established to validate that the project requirements have been met?).

By not conducting independent verification and validation analysis during user testing, the monitoring and high-level auditing of test activities by Maximus is questionable, especially considering that they were not aware of key details and issues regarding the user acceptance test case environment.

According to federal regulations¹¹ the “Independent Verification and Validation efforts must be conducted by an entity that is independent from the State (unless the State receives an exception from the Department [U.S. Department of Health and Human Services]) and the entity selected must [among other things]:

- (4) Conduct an analysis of past project performance sufficient to identify and make recommendations for improvement.
- (5) Provide risk management assessment and capacity planning services.”

¹¹ *Code of Federal Regulations*, 45 CFR 95.626, Independent Verificaiton and Validation

FINDINGS AND RECOMMENDATIONS

Overall, by relying on the test result reports of other vendors and not monitoring user test case details using the SILK tool, Maximus did not minimize system implementation risks. The main reason independent test case analysis of user and production testing did not occur was because the technical duties outlined in the contract did not enforce the independent monitoring and auditing of test activities.

Flawed Monthly Assessments by the NC Enterprise Project Management Office

The state's Enterprise Project Management Office (EPMO) has not assessed the NCTracks project properly during its monthly assessments as a result of having inflexible project indicator guidelines and a weakness in its project portfolio management (PPM) tool. By consistently rating the overall NCTracks project as "Green" for the past 12 months, EPMO has bypassed the development of formal corrective action plans and has increased the perception that this project, with a compressed timeline, has no issues or risks as it nears go-live.

All North Carolina IT projects of \$500,000 or more and approved by the State Chief Information Officer, are required to have monthly project status reports. These monthly reports are completed by the agency and submitted to EPMO using the online and centralized PPM Tool. The EPMO Quality Assurance (QA) staff is responsible for reviewing each month the comprehensive project status report submitted by the agency. During this review, an assessment is made by the QA staff to determine the status (i.e., Green, Yellow, Red) of the following eight project indicators:

- Overall
- Project Funding
- Phase Cost
- Project Scope
- Phase Milestones
- Project Staff Utilization
- Project Issue and Risk Management
- Project Status Reporting

Based on EPMO guidelines, in order for a project to receive an Overall rating of "Green" no more than one of the following three indicators must be "Yellow":

- Phase Milestones
- Phase Cost
- Project Scope

NCTracks has received a "Green" rating for the overall project for the past 12 months. During this time, EPMO has consistently assessed the NCTracks Phase Milestones as "Green", the Phase Cost as "Green", the Project Scope as "Green", and the Project Issue and Risk Management as "Green." The last time that the EMPO staff reported a concern for Phase Milestones was in 2011.

FINDINGS AND RECOMMENDATIONS

The fact that the NCTracks project has consistently been rated “Green” in these areas for the past year is a concern based on recent major NCTracks project developments, the EPMO use of inflexible project indicator guidelines, and a known weakness in its project portfolio management tool that affects the overall assessment of NCTracks. If assessed properly, the NCTracks project would have occasionally received an overall “Yellow” rating, resulting in a formal letter from the EPMO Director to the Department Project Manager and leading to the development of documented corrective action plans.

According to EPMO staff, the group has no flexibility in determining the color of a project status indicator, as the established guidelines are in fact the rules that dictate the overall color ratings. This approach contradicts the EPMO note on the Project Status Guidelines document that states that the definitions “are a guideline for EPMO staff to be used in project assessment activities.” As a result, EPMO assesses the project solely based on the information that the agency self-reports on a monthly basis.

Additionally, there is a weakness in the phase milestones portion of the EPMO online PPM tool. This weakness does not allow EPMO staff the ability to conduct proper and standard assessments of the overall project milestones. Specifically, the PPM tool does not allow agencies to input an end date for project milestones, the only options are “Planned Date” and “Forecast Date.” As a result, EPMO staff determines the phase milestones of a project to be “Green” as long as the agency has identified milestones, has updated the dates of milestones if they were not met, and provided a general update in the tool’s accomplishment section. EPMO staff indicated that they have no way of knowing if the agency self-established milestones are correct or knowing what the actual risk or impact is if milestones are not met.

Furthermore, there is also a weakness in the risk assessment portion of the PPM tool. A review of the NCTracks project using the tool showed that the project’s risk assessment had not been updated since 2009. As a result, the NCTracks project is currently rated as having a “Medium” risk. Analysis of the risk assessment questions indicate that the NCTracks project should be rated as having a “High” risk. According to EPMO, risk assessments do have a weakness because current processes only require program managers at the agency to update the overall risk assessment of a project when they are moving from one of the three information technology (IT) project workflow phases to another (i.e., Execution and Build to Implementation). Overall, agencies are currently not required to update the risk assessment portion of the PPM tool on a regular basis.

Recent major NCTracks project developments that also call into question the overall “Green” assessments of NCTracks involve the third contract amendment, between the Department and CSC, established in December 2012. As a result of this amendment, the scope and key project milestones of the project were changed significantly six months prior to go-live and without extending the go-live date, thus compressing the overall schedule. NCTracks is scheduled to undergo additional changes to its overall design almost three months before the established go-live date in order to implement almost 40 major change service requests (CSRs). Overall, the amendment:

- Shifted the initial operational readiness date (February 28, 2013) to be the same as the go-live date (July 1, 2013)

FINDINGS AND RECOMMENDATIONS

- Extended the end dates of the user and production testing phases
- Added a critical mini-user testing phase to start and end in May (i.e., ending just 30 days prior to go-live)
- Required the Department to push back the dates that it had originally set with EPMO to move from the NCTracks project from the execution and build phase to the implementation phase

Recent project issues and risks that call into question EPMO's overall "Green" assessments of NCTracks include:

- Major key personnel transition and staff turnover six months prior to go-live
- At the end of the initial user acceptance testing phase, acceptance criteria was not met and the phase required a one week extension
- Production simulation testing did not have any formal acceptance criteria in place until the last week of the testing phase
- Formal Go/No-Go criteria for the overall system has not been established
- CSC has reported and rated the NCTracks cost performance and schedule performance of some months as "Yellow"
- Maximus has provided recent monthly assessments that consider the overall NCTracks project to be "Yellow"

Overall, auditors found that based on the EPMO indicator guidelines, the NCTracks project will be rated overall as "Green", regardless of what the risk is, as long as the agency self-reported issues and risks have corrective action plans and the agency has updated the milestone dates that it did not meet.

During the audit, the EPMO Director indicated that EPMO is preparing for the installation of a new system that will replace their project portfolio management (PPM) tool. According to the Director, this upgrade will provide EPMO the opportunity to update various project management indicators and guidelines, and will improve the overall oversight of State IT projects.

Recommendations:

1. The Department and EPMO should review the Maximus contract to assess work deliverables and identify improvement areas and current limited capabilities to monitor and require that Maximus provides an effective and independent service that will facilitate the required CMS certification for NCTracks.
2. EPMO should request, based on the findings of this report, that Maximus conduct an independent assessment of test cases executed during the user acceptance testing in May and deliver an "ad-hoc report".
3. EPMO should adjust the frequency in which all major state IT projects are required to complete their overall risk assessment so that it occurs on a quarterly basis rather than waiting for a project to move to a new phase.
4. EPMO should develop additional enterprise criteria and enhance processes to assist in effectively assessing all state IT projects that are within six months of go-live.

FINDINGS AND RECOMMENDATIONS

FINDING #4: ACCESS CONTROL AND SECURITY ENVIRONMENT AT RISK ON GO-LIVE

The Department has not made key decisions that are necessary for the proper implementation and documentation of the access control and security environment of NCTracks. This could lead to a delayed and insecure implementation of the NCTracks system.

- (1) How to create approximately 1,500 Department and non-state user accounts for go-live
- (2) How to manage the Privacy and Security Officer role on go-live

The Department and CSC (the vendor) indicate that these key decisions and related documentation have not been established due to additional time needed to evaluate options. Also, no current plan or documented timeline is in place that shows when these decisions must be made. This is a significant risk considering that the original operational readiness date of February 28, 2013, has already passed.

The *State of North Carolina Statewide Information Security Manual*, states:

“Whether the system is developed or updated by in-house staff or by a third-party vendor, agencies shall ensure that each new or updated system includes adequate system documentation. Agencies shall ensure that system documentation is readily available to support the staff responsible for operating, securing and maintaining new and updated systems.”¹²

Pending Decision and Documentation on How to Create 1,500 User Accounts for Go-Live

The Department has not decided how the approximately 1,500 user accounts necessary for DHHS employees and non-state users on go-live will be created. The Department is currently evaluating whether the user accounts will be created by a batch method or if authorizing managers over each division within the Department will be creating the user accounts.

The batch method requires at once a complete list of all Department users who require access to the NCTracks system along with their associated user role. This method requires the system to have an audit trail capability. The authorizing manager method would require every authorizing manager to create every user account under their responsibility one at a time. This method requires the system to be ready at least two weeks prior to the go-live date.

As a result of this decision not being made, there are currently no documented procedures that describe how the user accounts will be created, the type of user access that will be provided to each of these accounts, and how the initial user access audit logs will be recorded.

¹² Section 080401, Documenting New and Enhanced Systems

FINDINGS AND RECOMMENDATIONS

Pending Decision and Documentation on How the PSO Role Will Be Managed on Go-Live

The Department has also not decided whether the privacy and security officer (PSO) role and responsibilities will be centralized or decentralized. A centralized position is the current approach and entails one individual at the Department administering the overall access security control of the NCTracks system. A decentralized PSO approach would entail a separate PSO at each division within the Department.

As a result of this decision not being made, key documentation of procedures for granting, terminating, and auditing user access to the system once it is in production have yet to be established and finalized. Additionally, as of March 1, 2013, no training or documentation has been provided or established in the event that a decentralized PSO approach is taken.

Recommendations:

1. The Department should make these key decisions with sufficient time prior to July 1, 2013, to allow staff the time to create and establish all key access control procedures and documentation, conduct internal reviews, and train appropriate staff.
2. The Department should document the decisions made and include the reasoning for the chosen approach.
3. All documentation developed pertaining to NCTracks access controls and security should be stored securely in a centralized location known to management and should be readily available to support the staff responsible for operating, securing, and maintaining the new system on go-live.

FINDING #5: NO FORMAL CRITERIA FRAMEWORK EXISTS TO DETERMINE IF NCTRACKS IS READY FOR GO-LIVE

Go/No-go (go-live) criteria: A formal pre-determined set of critical success criteria used to determine if a system is ready for go-live.
--

The Department does not have a formal Go/No-go criteria framework to determine if NCTracks is ready for go-live.

- (1) No go-live criteria framework exists
- (2) No documented draft on what the Go/No-go criteria will be
- (3) No documented timeline for when criteria will be completed

Not having any formal Go/No-go framework, criteria, and timeline is a result of inadequate go-live planning by the Department and increases the risk of implementing a system that may not be ready for operations considering that the original operational readiness date for NCTracks, February 28, 2013, has already passed. Additionally, the new system is currently undergoing additional major upgrades and testing and formal Go/No-go criteria should be pre-determined and not established after all test results are known.

FINDINGS AND RECOMMENDATIONS

On January 28, 2013, the Department indicated that the Go/No-go criteria framework was being developed and would be completed in mid-February. According to the Department, the plan now is to develop formal Go/No-go criteria by the end of April. This plan will involve CSC (the vendor) developing and proposing the initial go/no-go criteria so that the Department can then evaluate it. However, Go/No-go criteria is normally first proposed by the organization based on input from various internal key stakeholders and is not proposed by the vendor. Once the go-live criteria framework has been agreed upon, it will be presented to the NCMMIS+ Program Steering Committee¹³ who will review and approve the criteria.

Additionally, on February 28, 2013, the Department gave HP Enterprise Services notice of termination of the existing MMIS contract effective July 7, 2013. The Department made this decision even though no go-live criteria exists and while user acceptance testing and production simulation testing are still in progress.

According to the Department, the decision to terminate the existing contract was made based on the terms of the contract with HP and the fact that the Department met, on February 28, 2013, the minimum acceptance criteria for the main user acceptance testing phase. Even though the main user testing phase met acceptance criteria at that point, user testing as a whole is still ongoing. Furthermore, acceptance criteria for user testing does not constitute formal Go/No-go criteria for the overall system.

The Department's decision to terminate the existing contract was due to the contractual requirement to notify HP of termination 120 days in advance and was not based on NCTracks meeting a formal set of Go/No-go criteria. According to the Department, if the letter to HP had not been sent on February 28, 2013, the State would have been responsible for paying two vendors (i.e., CSC and HP) after July 1, 2013, with the Centers for Medicare and Medicaid Services (CMS) only paying the federal portion for only one system. The Department has indicated that CMS agreed to pay the federal portion of the two systems through July 7, 2013, thus providing a failover option for the Department if there is a problem with the NCTracks implementation on July 1, 2013.

According to the Department, the letter to HP does not constitute formal acceptance of the NCTracks system. The Department has indicated that if the NCTracks system is not ready for go-live on July 1, 2013, HP will be willing to continue its services as long as needed. However, there is no guarantee that this continuation of services would occur or at what cost to the State as this is not in writing.

In addition, the Department's stated approach, meeting acceptance criteria for user testing for assessing NCTracks operational readiness, does not align with the most recent contract amendment with CSC. The Department has yet to accept the final pre-implementation deliverable and has yet to formally consider user acceptance testing and production simulation testing to be completed:

¹³ The NCMMIS+ Program Steering Committee is composed of voting and non-voting members representing various divisions of the Department, the Office of the State Chief Information Officer, the Office of the State Controller, the General Assembly, and the Office of State Budget and Management.

FINDINGS AND RECOMMENDATIONS

“The Vendor will be deemed to have achieved Operational Readiness only after the State has accepted the final Milestone or Deliverable for the Design, Development, and Installation (DDI) phase, and after User Acceptance Testing and Production Simulation Testing have been completed to the State’s reasonable satisfaction.”¹⁴

The *ISACA COBIT 5 Framework*, for the governance and management of enterprise IT, states that organizations should “Assess the project at agreed-on major stage-gates, releases or iterations and make formal go/no-go decisions based on predetermined critical success criteria.”¹⁵

Recommendations:

1. The NCMMIS+ Program Steering Committee should establish a formal process and timeline for the Department to develop, review, and approve a go-live criteria framework for NCTracks before the completion of the user acceptance testing in May.
2. The Department should re-evaluate its current “Go” decision for July 1, 2013, once final Go/No-go criteria is established and documented. This assessment should incorporate the final user acceptance testing and production simulation testing results.

¹⁴ Amendment Number 3 to the CSC Contract, Section 1.1

¹⁵ Management Practice BAI01.11, Monitor and Control Projects

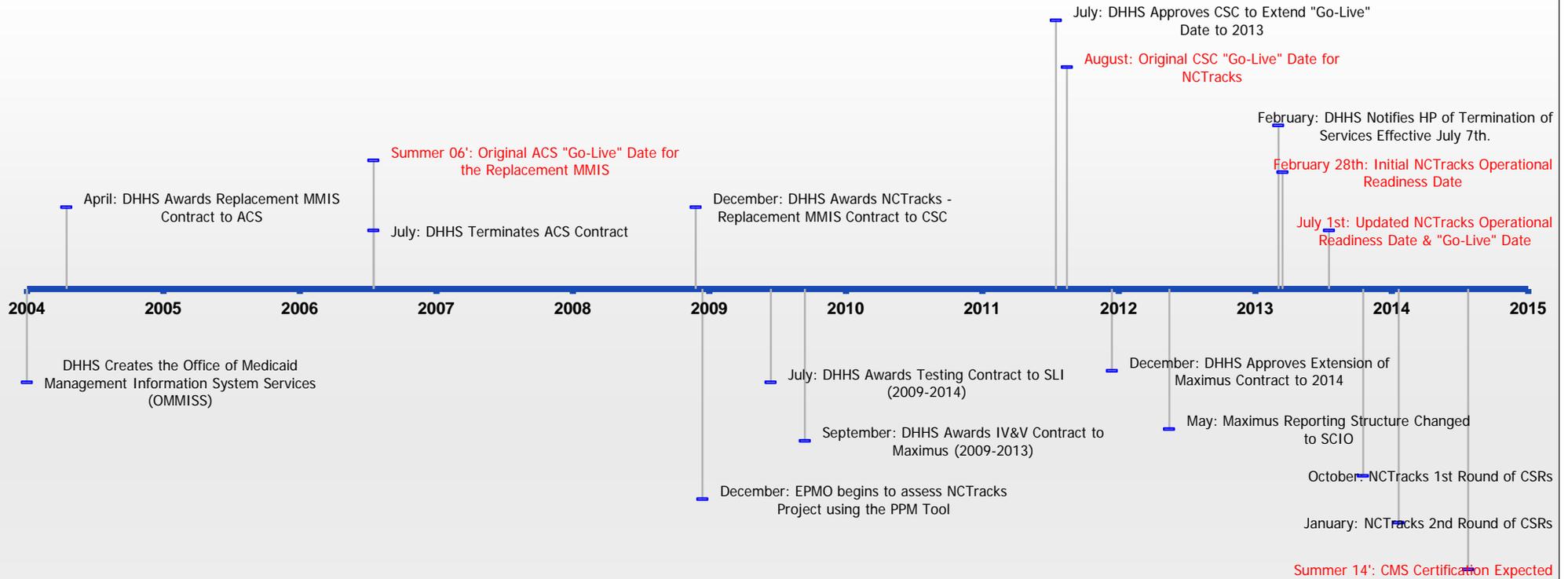
APPENDIX A

Status of NCTracks “Critical” Test Cases
(Cases with a Priority 1 or Priority 2 Classification)

Category	As of February 22nd (End of main UAT)
Total Number of Critical Priority Test Cases	834
Number of Critical Priority Test Cases in “Failed” status	123
Number of Critical Priority Test Cases “Not Executed/Not Scheduled”	285
Source: SILK computer-generated report	

Business Process Affected	Number of Critical Priority Test Cases “Not Executed/Not Scheduled”
Rx Claims	18
Provider	114
Medical Claims	3
Recipient	24
Financial	69
Managed Care	3
Third Party Liability (TPL)	2
Management & Administrative Reporting (MARS)	52
TOTAL	285
Source: SILK computer-generated report	

A Brief Timeline: Replacing the NC DHHS Medicaid Management Information System



APPENDIX C

NCTRACKS PRE-IMPLEMENTATION SCHEDULE

Below is a brief illustration of the NCTracks schedule that shows the two pre-implementation phases, User Acceptance Testing (UAT) and Production Simulation Testing (PST), covered by this audit. The notes provided explain key dates mentioned in this report.

2012					2013					
Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
	User Acceptance Testing				Extended UAT	UAT +	NCTracks Major Upgrades		Mini UAT	
	Production Simulation Testing				Extended PST		Additional PST			
Original Operational Readiness Date: February 28, 2013										
Updated Operational Readiness and Go-Live Date: July 1, 2013 										

Notes:

1. UAT and PST were originally scheduled to end on January 16, 2013.
2. Based on the third amendment to the CSC contract in December 2012, the UAT phase was extended to February 22, 2013, and the PST phase was extended to March 16th.
3. The third contract amendment also created a separate a “mini-UAT” period in May to conduct testing of the additional major upgrades to the NCTracks system taking place in March and April.
4. On February 22, 2013, the rescheduled end date for UAT, the Department added an additional week for UAT (March 1, 2013) as the UAT acceptance criteria had not been met.

The following two pages provide additional background material to assist the reader in understanding the NCTracks environment:

- 1) Key NCTracks Stakeholders: Vendors and Oversight Entities
- 2) Key Terms and Definitions used in this report

NCTracks: Vendors and Oversight Entities

Vendors

- **Computer Sciences Corporation (CSC):** Responsible for developing, implementing, and operating NCTracks – the Replacement Medicaid Management Information System (MMIS), and serving as the new State fiscal agent.

Contract Terms: December 2008 – June 2020 (includes two one-year extensions)

Contract Cost: \$484,880,798

Number of Contract Amendments: Three (2009, 2011, 2012)

- **SLI Global Solutions Inc. (SLI):** Responsible for performing test management services for NCTracks and ensuring overall success of the State’s testing efforts.

Contract Terms: July 2009 – July 2014

Contract Cost: \$7,240,524

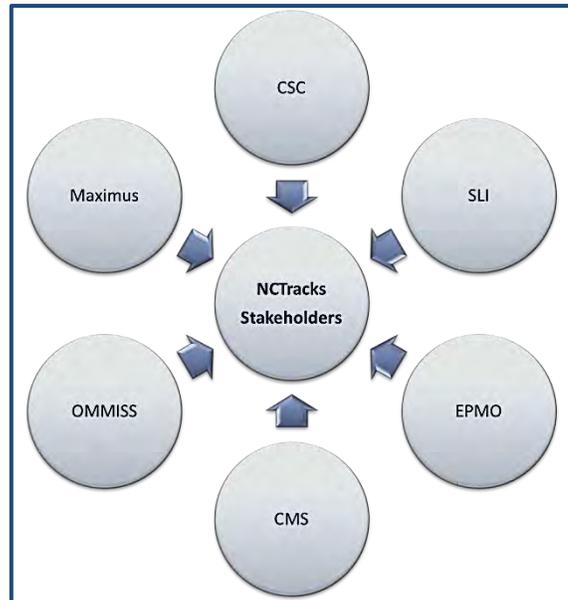
Number of Contract Amendments: One (2011)

- **MAXIMUS Consulting Services Inc.:** Responsible for providing Independent Verification and Validation (IV&V) services to help minimize system implementation risks and make recommendations to the Department executive management. In May 2012, the State’s Chief Information Officer (SCIO) and the Department Acting Secretary announced that the SCIO would assume responsibility for the management of Maximus.

Contract Terms: September 2009 – June 2014

Contract Cost: \$4,896,155.68

Number of Contract Amendments: Two (2009, 2012)



DHHS

- **OMMISS:** Created by DHHS in 2004, the Office of Medicaid Management Information System Services (OMMISS) is responsible for providing oversight and managing activities for the procurement and implementation of support systems and services for the replacement system.

State of NC

- **EPMO:** The North Carolina Enterprise Project Management Office (EPMO), operating under the direction of the State Chief Information Officer, is responsible for providing professional oversight of the NCTracks IT project by assessing the project on a monthly basis.

Federal Government

- **CMS:** The Centers for Medicare & Medicaid Services (CMS) will validate, after go-live, that the NCTracks system is designed to support the efficient and effective management of the Medicaid program and that the system is operating as described in the contract.

NCTracks: Key Terms and Definitions

Acceptance criteria: Defines the agreed-upon rules for determining whether the project deliverables for a particular phase have been successfully completed.

COBIT 5: Is a business framework for the governance and management of enterprise IT. It provides globally accepted principles, models, and practices to help increase the trust in, and value from, information systems.

Go/No-go (go-live) criteria: A formal pre-determined set of critical success criteria used to determine if a system is ready for go-live.

Go-live: The moment when a system, which had been under development or operating in a limited test mode, becomes fully active. The established go-live date for NCTracks is July 1, 2013.

Independent Verification and Validation (IV&V): A service that is technically, managerially, and financially independent of any party affiliated with the business application or infrastructure being tested. Identifies potential improvements or identifies problems before they occur.

ISACA: An independent, nonprofit, global association engaged in the development, adoption, and use of globally accepted, industry-leading knowledge and practices for information systems.

Medicaid Management Information System (MMIS): The Medicaid claims processing and information retrieval system that states are required to have.

NCID: A unique User-ID granted by the Office of Information Technology Services as part of North Carolina's standard identity management and access service provided to state, local, business and citizen users.

NCTracks: The new and replacement Medicaid Management Information System developed by CSC.

User role: A standard set of access permissions granted to a predefined subset of system users. The NCTracks system has user roles that will dictate the type of access that an individual user will have based on their job function.

Project Portfolio Management (PPM) Tool: The online and centralized management tool used by agencies monthly to self-report on the status of IT projects and used by EPMO to assess all NC IT projects based on established indicators.

Privacy and Security Officer (PSO): The PSO is responsible for safeguarding the information entrusted to the department from unauthorized use, disclosure, modification, damage, or loss.

Production Simulation Testing (PST): The final subphase of testing, the overall goal of PST is to demonstrate that the NCTracks system is ready to support production operations.

SILK: The test management tool used by testers during the NCTracks UAT and PST phases to conduct tests, record test results, track test defects and other issues, and provide reports of test activities during the NCTracks UAT and PST phases

Test benchmark: A standard by which a test result can be measured.

Test defect: A term used if discrepancies exist between the predicted test results and the actual test results.

Test severity level: A priority code assigned to a test defect that alerts staff to the relative need of immediate action to correct the defect. During NCTracks testing five severity levels were used.

User Acceptance Testing (UAT): A key subphase of testing that provides DHHS users the opportunity to test, review, and accept system components. The overall goal of UAT is to demonstrate that NCTracks meets the detailed functional requirements and specifications of the business processes.

APPENDIX F – DEPARTMENT RESPONSE



North Carolina Department of Health and Human Services

Pat McCrory
Governor

Aldona Z. Wos, M.D.
Ambassador (Ret.)
Secretary DHHS

May 16, 2013

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

Dear Auditor Wood:

We have reviewed the results of your performance audit of information technology controls titled *Department of Health and Human Services, NCTracks (MMIS Replacement) – Implementation*. The following represents our responses to the Report Findings and Recommendations.

FINDINGS AND RECOMMENDATIONS

FINDING #1: HUNDREDS OF CRITICAL USER TEST CASES WERE NOT EXECUTED

NCTracks has not been fully tested to confirm that it can produce and support the most critical business functions:

- (1) All critical priority test cases were not executed
- (2) All key user role test cases were not fully executed
- (3) Integrated test documentation does not exist

If user acceptance testing is accepted without addressing these issues, a high risk exists that critical NCTracks functions could have major errors on go-live and possibly lead to a delayed CMS certification of the system.

The Department did not provide adequate oversight during user testing. By failing to track and ensure that all critical priority test cases were executed, the Department lacks sufficient information to assess whether NCTracks meets the requirements of its users.

The *State of North Carolina Statewide Information Security Manual*, states that Agencies shall develop a process to ensure that new systems and equipment are fully tested and formally accepted by users before management accepts the systems and places into the operational environment.

www.ncdhhs.gov
Telephone 919-855-4800 • Fax 919-715-4645
Location: 101 Blair Drive • Adams Building • Raleigh, NC 27603
Mailing Address: 2001 Mail Service Center • Raleigh, NC 27699-2001
An Equal Opportunity / Affirmative Action Employer

APPENDIX F – DEPARTMENT RESPONSE

Honorable Beth A. Wood
May 16, 2013
Page 2 of 8

The *ISACA COBIT5 Framework* states that organizations should undertake all tests in accordance with the test plan, that the test plan reflects an assessment of risk, and that all functional and technical requirements are tested.

Recommendations:

1. The Department should review the high priority test cases that were not executed and assess against the “Gap List” that will be used to determine and schedule test cases during the user acceptance testing in May.

DHHS Response: *The Department agrees with this recommendation and has completed such an assessment. During planning for the May UAT, staff from OMMISS and the divisions participating in the NCTracks project conducted a risk assessment, and created a list of testing gaps, including high-priority test cases. Each gap was then assessed to verify that the testing concern had not yet been addressed in any phase of user acceptance or production simulation testing. In some cases, “gaps” had, in fact, been tested and were removed from the list. Any gaps that could be tested as part of change request testing or defect validation were assigned to an appropriate test scenario. All remaining gaps were assigned individual test cases for execution in May.*

2. The Department should develop, prior to go-live, a comprehensive user acceptance testing “scheduled vs. not executed” test case report and this report should be available to all Department NCTracks stakeholders.

DHHS Response: *The Department agrees with this recommendation and plans to develop a “scheduled but not executed” test case report following completion of the May user acceptance testing. The report will be made available to all Department NCTracks stakeholders.*

3. The Department should test, during the user acceptance testing in May, all NCTracks user role test cases that have not been executed.

DHHS Response: *The Department agrees with this recommendation and is testing all State and Provider user roles during the May user acceptance testing period. Fiscal agent roles will be tested by CSC, with documentation to be provided by CSC listing the roles tested and the method used to accomplish the test.*

4. A report that shows the status of all user role test cases should be developed and shared with all the authorizing managers of the new system prior to go-live.

DHHS Response: *The Department agrees with this recommendation. Following completion of the May user acceptance testing, a list of test cases used to test State and provider roles, along with test case execution results, will be made available to Department authorizing managers.*

5. NCTracks accounts for Department users should be created with enough time prior to July 1, 2013, to allow all the new system users to view and test their own level of access and request necessary adjustments.

APPENDIX F – DEPARTMENT RESPONSE

Honorable Beth A. Wood
May 16, 2013
Page 3 of 8

***DHHS Response:** The Department does not disagree with this recommendation, but believes it would be unwise, at this late juncture, to modify the implementation plan at the level of detail specified in the recommendation.*

The programmatic batch processes for creating the Department's individual user access accounts have been tested during the May user acceptance test UAT.

As part of the May UAT testing, OMMISS has worked with users to ensure they have requested roles appropriate to their approved business requirements upon go live. This exercise completely mimics the actual production processes and access rights.

OMMISS will also work with authorizing managers within DHHS to help ensure employees are provisioned with the correct user roles. Training sessions are underway to help authorizing managers understand the steps to be undertaken for their staff to gain the required NCTracks access. If users encounter problems following the operational start of the system, OMMISS will work with CSC to resolve the issues.

6. The Department should continue to work with providers to ensure that they understand the user role and access control process on go-live.

***DHHS Response:** The Department agrees with this recommendation. Training for providers is ongoing using multiple delivery methods. Instructor-led training is being conducted in six cities throughout North Carolina. Providers and their staff can attend in person or view the training over the Internet using WebEx. Each of these training courses is being recorded for access by providers and their staff at a future date over the Internet. In addition, computer based training modules are accessible through the NCTracks web portal.*

7. The Department should integrate, in a traceable manner, all the documents about NCTracks requirements, business processes, test builds, and test cases.

***DHHS Response:** The Department agrees with this recommendation. The requirements traceability matrix, which traces requirements to business processes, and the development builds will be extended to include: The 12,667 test cases executed by CSC during build system integration testing and reviewed by OMMISS staff; the test cases executed by the Department during user build acceptance testing; and, the test cases executed by the Department during user acceptance testing.*

8. Once requirements are linked to test cases, the Department should re-evaluate user acceptance testing results to assess whether or not all NCTracks functional requirements were tested.

***DHHS Response:** The Department does not disagree with this recommendation; however considering the extensive amount of testing NCTracks has undergone over the past thirty months it is not practical to complete this assessment prior to go-live.*

FINDING #2: PRODUCTION SIMULATION TESTING PROCESS FLAWED

Serious flaws exist in the production testing process that began on August 29, 2012, and ended on the rescheduled date of March 16, 2013.

APPENDIX F – DEPARTMENT RESPONSE

Honorable Beth A. Wood
May 16, 2013
Page 4 of 8

- (1) Acceptance criteria for NCTracks was not established before production testing
- (2) The vendor building NCTracks developed the acceptance criteria
- (3) A detailed and integrated test plan with test benchmarks was not created
- (4) The severity of test defects identified was not reviewed and assessed jointly with the vendor

Inadequate oversight of production testing by the Department risks the readiness of NCTracks to fully support production operations. As a result of not having a defined test plan and testing acceptance criteria, the Department relied solely on the vendor. This increases the risk that the Vendor underreported the severity of defects to meet acceptance criteria and could lead the Department to inadequately assess the overall production system testing and encounter issues on go-live.

Recommendations:

1. The Department should develop documentation that clearly identifies the benchmarks for tests conducted during the production simulation testing phase.

DHHS Response: The Department agrees with this recommendation. OMMISS will define benchmarks for tests conducted during PST that did not have clearly defined benchmarks. As noted in the audit report, additional benchmarks are not required for the comparative claims test.

2. The Department should evaluate final production simulation test results against benchmarks

DHHS Response: The Department agrees with this recommendation. The results of each test will be compared against the new benchmarks. Additionally, the results will be reviewed with the NCTracks Executive Committee.

3. The Department should revisit the current acceptance criteria for the production simulation testing phase and receive formal approval by the NCTracks Executive Committee.

DHHS Response: The Department agrees with this recommendation. The acceptance criteria for production simulation testing have been reviewed and approved by the NCMMIS+ Steering Committee.

4. The Department should assess final production simulation test results against the revised production simulation testing acceptance criteria.

DHHS Response: The Department agrees with this recommendation. The final production simulation test results will be assessed against the acceptance criteria for PST approved by the NCMMIS+ Steering Committee on May 14, 2013.

5. As part of the production simulation testing deliverable review, the Department should conduct a review of all open test defects and their assigned severities before production testing is accepted.

DHHS Response: The Department agrees with this recommendation. As noted in the audit report, OMMISS had planned to conduct such a review at the conclusion of production simulation testing. OMMISS, working with its Test Management Services vendor, SLI, reviewed all open defects following the completion of production simulation testing and the submission of the PST Final Results deliverable. During this review, it was discovered that CSC had misclassified 14 defects as severity three that should have been classified as severity two. This change in severity was made prior to the acceptance of the

APPENDIX F – DEPARTMENT RESPONSE

Honorable Beth A. Wood
May 16, 2013
Page 5 of 8

deliverable. OMMISS confirmed that the change in severity classification for these 14 defects did not affect the achievement of the PST acceptance criteria.

FINDING #3: INDEPENDENT ASSESSMENTS ARE FLAWED AND PUT SYSTEM READINESS AT RISK

During the user acceptance testing and production simulation testing phases, Maximus, the independent verification and validation (IV&V) services vendor, relied exclusively on the test result reports of other vendors to conduct its own test case analysis. By relying on other vendors, Maximus did not minimize system implementation risks as required by the federal Centers for Medicare and Medicaid Services (CMS).

In addition, the state's Enterprise Project Management Office (EPMO) has not assessed the NCTracks project properly as a result of having: (1) inflexible project indicator guidelines, and (2) a weakness in its project portfolio management tool. By consistently rating the overall NCTracks project as "Green", even though it has warranted "Yellow" ratings at times, EPMO has increased the perception that this project has no issues or risks as it nears go-live.

Recommendations:

1. The Department and EPMO should review the Maximus contract to assess work deliverables and identify improvement areas and current limited capabilities to monitor and require that Maximus provides an effective and independent service that will facilitate the required CMS certification for NCTracks.

DHHS Response: The Department accepts this recommendation and will work with the EPMO and Maximus to finalize the Maximus work plan to ensure it clearly identifies work deliverables that will facilitate the required CMS certification.

2. EPMO should request, based on the findings of this report, that Maximus conduct an independent assessment of test cases executed during the user acceptance testing in May and deliver an "ad-hoc report".

DHHS Response: The Enterprise Project Management Office (EPMO) will respond to this recommendation.

3. EPMO should adjust the frequency in which all major state IT projects are required to complete their overall risk assessment so that it occurs on a quarterly basis rather than waiting for a project to move to a new phase.

DHHS Response: The Enterprise Project Management Office (EPMO) will respond to this recommendation.

4. EPMO should develop additional enterprise criteria and enhance processes to assist in effectively assessing all state IT projects that are within six months of go-live.

DHHS Response: The Enterprise Project Management Office (EPMO) will respond to this recommendation.

APPENDIX F – DEPARTMENT RESPONSE

Honorable Beth A. Wood
May 16, 2013
Page 6 of 8

FINDING #4: ACCESS CONTROL AND SECURITY ENVIRONMENT AT RISK ON GO-LIVE

The Department has not made key decisions that are necessary for the proper implementation and documentation of the access control and security environment of NCTracks. This could lead to a delayed and insecure implementation of the NCTracks system.

- (1) How to create approximately 1,500 Department and non-state user accounts for go-live
- (2) How to manage the Privacy and Security Officer role on go-live

The Department and CSC (the vendor) indicate that these key decisions and related documentation have not been established due to additional time needed to evaluate options. Also, no current plan or documented timeline is in place that shows when these decisions must be made. This is a significant risk considering that the original operational readiness date of February 28, 2013, has already passed.

The *State of North Carolina Statewide Information Security Manual*, states:

“Whether the system is developed or updated by in-house staff or by a third-party vendor, agencies shall ensure that each new or updated system includes adequate system documentation. Agencies shall ensure that system documentation is readily available to support the staff responsible for operating, securing and maintaining new and updated systems.”

Recommendations:

1. The Department should make these key decisions with sufficient time prior to July 1, 2013, to allow staff the time to create and establish all key access control procedures and documentation, conduct internal reviews, and train appropriate staff.

DHHS Response: Department agrees with this recommendation. The key decisions have been made: 1) Programmatic batch processes have been developed and tested in UAT for creating over 1,500 Department and Fiscal Agent user accounts 2) NCTracks will have a centralized Privacy and Security Office function.

All access control procedures have been defined and documented. Internal reviews have been conducted to ensure compliance with State policies and security framework. Training is being provided to appropriate staff on the access controls and security framework for NCTracks.

2. The Department should document the decisions made and include the reasoning for the chosen approach.

DHHS Response: The Department agrees with this recommendation. The Department has completed documentation of the batch process for creating NCTracks user accounts; and documentation regarding a centralized Privacy and Security Office function is in process.

3. All documentation developed pertaining to NCTracks access controls and security should be stored securely in a centralized location known to management and should be readily available to support the staff responsible for operating, securing, and maintaining the new system on go-live.

APPENDIX F – DEPARTMENT RESPONSE

Honorable Beth A. Wood
May 16, 2013
Page 7 of 8

***DHHS Response:** The Department agrees with this recommendation. All documentation developed pertaining to NCTracks access controls and security has been stored and secured on the project's document repository, ShareNet.*

FINDING #5: NO FORMAL CRITERIA FRAMEWORK EXISTS TO DETERMINE IF NCTRACKS IS READY FOR GO-LIVE

The Department does not have a formal Go/No-go criteria framework to determine if NCTracks is ready for go-live.

- (1) No go-live criteria framework exists
- (2) No documented draft on what the Go/No-go criteria will be
- (3) No documented timeline for when criteria will be completed

Not having any formal Go/No-go framework, criteria, and timeline is a result of inadequate go-live planning by the Department and increases the risk of implementing a system that may not be ready for operations considering that the original operational readiness date for NCTracks, February 28, 2013, has already passed. Additionally, the new system is currently undergoing additional major upgrades and testing and formal Go/No-go criteria should be pre-determined and not established after all test results are known.

Recommendations:

1. The NCTracks Executive Committee should establish a formal process and timeline for the Department to develop, review, and approve a go-live criteria framework for NCTracks before the completion of the user acceptance testing in May.

***DHHS Response:** The Department agrees with this recommendation. The system acceptance criteria have been formalized and approved by the NCMMIS+ Steering Committee on May 14, 2013.*

2. The Department should re-evaluate its current "Go" decision for July 1, 2013, once final Go/No-go criteria is established and documented. This assessment should incorporate the final user acceptance testing and production simulation testing results.

***DHHS Response:** The Department agrees with this recommendation. Upon completion of user acceptance and production simulation testing, the Go/No-go decision will be re-evaluated using the formalized criteria approved by the NCMMIS+ Steering Committee.*

APPENDIX F – DEPARTMENT RESPONSE

Honorable Beth A. Wood
May 16, 2013
Page 8 of 8

We greatly appreciate the assistance and professionalism provided by your audit staff in the performance of this audit. If you need any additional information, please contact Mary R. Johnson at (919) 855-3738.

Sincerely,



Aldona Wos, M.D.

AZW:mrj

cc: Sherry Bradsher, Deputy Secretary
Matt McKillip, Senior Policy Advisor
Joseph Cooper, Jr., Chief Information Officer
Ms. Angeline Sligh, Director, Office of Management Information
System Services
Emery E. Milliken, General Counsel
Jim Slate, Director, Budget and Analysis
Laketha M. Miller, Controller
Chet Spruill, Director, Office of Internal Audit
Monica Hughes, Branch Head, Audit Resolution & Monitoring

APPENDIX G – ITS RESPONSE



State of North Carolina Office of Information Technology Services

Pat McCrory
Governor

Chris Estes
State Chief Information Officer

May 14, 2013

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

Dear State Auditor Wood:

We have reviewed the May 2013, confidential draft of the audit entitled "Department of Health and Human Services, NCTRACKS (MMIS Replacement) – Implementation." We agree with the finding pertaining to the Enterprise Project Management Office (EPMO), and thank you for providing recommendations to improve IT project management in the State of North Carolina.

ITS will work closely with the Office of Medicaid Management Information Systems (OMMIS) and the vendor to complete your recommendations on the May User Acceptance Test (UAT) and Center for Medicaid Services (CMS) Certification by the end of June.

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

Finding #3: Independent Assessments are Flawed and Put System Readiness at Risk

Recommendation: The Department and EPMO should review the Maximus contract to assess work deliverables and identify improvement areas and current limited capabilities to monitor and require that Maximus provides an effective and independent service that will facilitate the required CMS certification for NCTRACKS.

ITS Response: We agree with this recommendation. EPMO will work with the Department to review and assess the Maximus contract and areas for improvement. We will provide recommendations to the Department for collaboration with Maximus to finalize the Maximus work plan with detailed work deliverables, and a plan to provide independent review of CMS certification.

Recommendation: EPMO should request, based on findings of this report, that Maximus conduct an independent assessment of test cases executed during the user acceptance testing in May and deliver an "ad-hoc report".

P.O. Box 17209, Raleigh, NC 27619-7209
4101 Mail Service Center, Raleigh NC 27699-4101
Telephone: 919-754-6100
An Equal Opportunity/Affirmative Action Employer

APPENDIX G – ITS RESPONSE

ITS Response: We agree and Maximus is scheduled to provide an “ad-hoc” report of a sampling audit of the May UAT. This is planned to be completed from May 18, 2013 to June 8, 2013 and we will monitor to completion.

Recommendation: EPMO should adjust the frequency in which all major state IT projects are required to complete their overall risk assessment so that it occurs on a quarterly basis rather than waiting for a project to move to a new phase.

ITS Response: We agree and are currently working with agencies to update processes and procedures including requiring a risk assessment for all major projects, options to improve the risk assessment scoring and potentially increasing the frequency risk assessment reviews.

Recommendation: EPMO should develop additional enterprise criteria and enhance processes to assist in effectively assessing all state IT projects that are within six months of go-live.

ITS Response: We agree with this recommendation and will evaluate process and tool modifications to improve program oversight effectiveness. We will establish a check point in our current and future processes to include implementation reviews for go-live readiness.

Thank you again for the opportunity to respond to the 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

ORDERING INFORMATION

Copies of this report may be obtained by contacting the:

Office of the State Auditor
State of North Carolina
2 South Salisbury Street
20601 Mail Service Center
Raleigh, North Carolina 27699-0601

Telephone: 919/807-7500

Facsimile: 919/807-7647

Internet: <http://www.ncauditor.net>

To report alleged incidents of fraud, waste or abuse in state government contact the:

Office of the State Auditor Fraud Hotline: **1-800-730-8477**

Office of the State Auditor Fraud App:



<https://play.google.com/store/apps/details?id=net.ncauditor.ncauditor>

For additional information contact:

Bill Holmes
Director of External Affairs
919/807-7513

This audit was conducted in 1184 hours at an approximate cost of \$85,248. The total cost of the audit represents .017% of the total NCTracks cost of \$497,017,478 and represents .0006% of the total Medicaid budget (over \$14 billion) for the fiscal year ended June 30, 2012.