MEMORANDUM

Legislative Division of Post Audit
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TO: Members, Senate Ways and Means Committee
FROM: Scott Frank, Legislative Post Auditor
DATE: February 6, 2013
SUBJECT: Testimony on SB 2

I appreciate the opportunity to testify in favor of Senate Bill 2, which would amend the
Legislative Post Audit Act to create a new form of IT audit—systems implementation audits.

Issues With Government IT Projects

As of September 2012, the State of Kansas had 23 active IT projects under development that
were each expected to cost at least $250,000, including two that were expected to cost at least
$40 million. Currently, these projects are overseen at three different levels. First, all such
projects are overseen centrally by the Enterprise Project Management Office within the Office of
Information Technology (OITS). Second, each branch of government has a Chief Information
Technology Officer (CITO) who is responsible for overseeing the projects within his or her own
branch. Each CITO is also responsible for working with the other CITOs to coordinate IT
projects across all three branches. Finally, the Legislative Branch CITO provides periodic
progress reports on the status of all large projects to the Legislature's Joint Committee on
Information Technology (JCIT). The system relies heavily on self-reported status reports that
are prepared by the manager for each project and compiled by the Enterprise Project
Management Office.

Despite these three layers of oversight, several recent projects within the state have run
significantly behind schedule, come in over budget, or have not delivered the functionality that
was expected. For example, the Department of Administration's SMART accounting system
($46 million) and the Department of Revenue's new motor vehicle system were both
implemented in recent years but have not functioned as expected. Perhaps most notable is the
Department of Labor's Unemployment Insurance Modernization project ($47 million). The
project began in 2004, stopped and restarted several times with different vendors, and was finally
canceled in 2011 with only a few usable components completed.

Unfortunately, unsuccessful government IT projects are common. Various articles in online
literature suggest that 25-50% of all government IT projects run over budget, are not completed
on time, or fail to deliver the functionality that was expected. In 1995, Legislative Post Audit
developed a guidance document for agencies that summarized many of the reasons why IT
projects in Kansas had under delivered or completely failed. Those reasons included agencies
failing to conduct an adequate needs assessment before the project started, putting staff in charge
of overseeing the project who lacked adequate project management training and experience, and

not implementing an adequate quality control process to check the vendors' work. A copy of the 1995 document is attached (see **Attachment A**).

Systems Implementation Audits

Historically, audit offices in most states rarely get involved in evaluating a government IT project until after it has failed. For example, Legislative Post Audit has been directed to evaluate problems associated with the Department of Revenue's rollout of its new motor vehicle system in May 2012 (see **Attachment B**). While audits such as this are useful in determining who was at fault and what went wrong with a specific project, the lessons learned from these audits are not easily transferred to other projects. As a result, after-the-fact audits of specific projects are limited in their ability to prevent future problems.

At least two state audit offices have taken a more proactive approach to auditing IT projects in order to more effectively prevent problems before projects fail. In Virginia and Colorado, the state auditors conduct continuous audits of ongoing IT projects, also known as systems implementation audits.

These states assign trained project management auditors to monitor high-risk IT projects early in the process. The auditors attend all project planning and status meetings, and review bi-weekly status reports to monitor the progress of their assigned projects. They look for indications that the project might be in trouble, including many of the kinds of issues identified in our 1995 guidance document. The advantage of having an outside auditor embedded in a project is that outside auditor may recognize the signs of trouble more easily than a project manager who has a vested interest in the success or failure of the project.

When the auditors identify problems that indicate a project may be at risk, the audit office communicates the problems to agency management, to the central IT agency, and if necessary, to the Legislature. The goal is to identify problems early, when there are more options for addressing them, rather than allowing the problems to compound and have the project fail.

An example report from the Virginia Auditor of Public Accounts to Norfolk State University regarding potential problems with a new financial system is included as **Attachment C**. The auditors reviewed this system and identified a number of significant project management issues (e.g., unrealistic deadlines, a lack of contingency plans, no plans for status reports). According to officials from the state auditor's office, management carefully reevaluated its project plans and later acknowledged that the auditors played a critical role in getting the project back on track.

Provisions of Senate Bill 2

The first key provision of SB 2 would add a new category of audits to the Legislative Post Audit Act—information technology audits. This new category of audits would include the proposed systems implementation audits described above, as well as two types of IT audits Legislative Post Audit already conducts—IT security audits that examine the controls agencies place around their most sensitive data and data mining audits that look for potential waste, fraud, or abuse in the state's personnel and accounting transactions. Under the provisions of SB 2, all information

technology audits (systems implementation, IT security, and data mining) would be conducted at the direction of the Legislative Post Audit Committee.

The second, and more important provision of SB 2, would give the Post Auditor additional flexibility in reporting on any problems that arise during a systems implementation audit. Under current law, the findings of any audit are confidential until after they are presented to the Legislative Post Audit Committee in an open meeting. In the case of systems implementation audits, this would mean that potential problems with an IT project could not be communicated to anyone outside the agency until after a Post Audit Committee meeting. This could significantly slow down the ability of those who govern these IT projects to respond to problems.

SB 2 addresses this key reporting issue by giving the Post Auditor the authority to immediately communicate potential problems regarding a specific project to the Legislative Post Audit Committee, JCIT, and the three CITO's. This provision would be unique to systems implementation audits, but is critical because timely feedback is essential to correcting problems with IT projects.

Implementing Senate Bill 2

Staff Resources
We would plan to devote at least <u>two auditors</u> to systems development audits, which should give us the ability to continuously audit about 8-10 projects at a time. Based on our conversations with Virginia and Colorado, these auditors should be certified as Project Management Professionals (PMP) to make sure they have the necessary expertise and credibility. In order to preserve the continuity of the function, it would be important to have two certified auditors (to facilitate collaboration as well as preserve the function if one auditor were to leave).

The two audit positions do not necessarily need to be additional positions. They could come from within our existing positions, but shifting resources would reduce the staff available for regular performance audits. In other words, there is a tradeoff; <u>in the absence of additional resources, monitoring IT projects would mean conducting fewer performance audits or other IT audit work</u>.

Finally, we would not be in the position to begin monitoring projects immediately. Effective project management auditors require specific training that none of our auditors currently have. It would take us about 6-12 months to develop capacity to conduct these audits.

Selecting Projects
Even with two full-time project auditors, we would not have the resources to monitor all of the large IT projects in the state. Consequently, the Legislative Post Audit Committee would need a process to select the projects that would be audited. Virginia uses a risk-based approach, focusing its efforts on projects that are expensive, have a longer timeframe, are especially complicated, or involve agencies that have a poor history with IT projects. We would suggest a similar approach for Kansas, the details of which would be worked out by the Post Audit Committee through its committee rules.

Some Common Problems Noted In Computer-Related Audits
The Legislative Division of Post Audit
June 1995

Problems With Project Planning

- Often agencies started a computer development project without adequately assessing their needs. This led to time-consuming and costly modifications to the projects during their development.
- When planning projects, agencies did not sufficiently involve the end users of the systems in the decision making process.
- When agencies did a needs assessment, they often relied on software vendors who had a product to sell, rather than using an independent consultant.
- Significant costs—such as the time of State staff involved in the project—often were overlooked when establishing the budget and presenting it to the Legislature.

Contracting Problems

- When private contractors have been used, poorly written contracts have allowed vendors to be paid for systems that didn't work, or for work that was not satisfactory.

Staffing Problems

- Agency staff assigned to systems development projects didn't always have the necessary expertise.
- Agency staff were supposed to be provided to work on systems development, but often were not provided in sufficient numbers or for enough time for the project to be successfully completed.
- Agency staff, including project managers, often were expected to continue with their other duties and work on complex computer projects "on the side."

Management and Oversight Problems

- Project managers sometimes were given responsibility for a project, without being given authority to make crucial decisions or to commit the necessary resources to the project.
- Top management did not always lend their full endorsement to the project which led to disagreements and in-fighting among lower-level managers about what the system was supposed to do, what was to be done, and by whom.
- On many projects there was no quality-control review to assess the quality of the work vendors had provided before the vendor was paid.

Some Suggestions for Good Practices to Follow When Developing or Acquiring a New Computer System

The following list of good practices comes from recent audits of State computer systems, suggestions from State officials, and various references dealing with the planning and implementation of new computer systems. These good practices can and should be followed when developing a system in-house or when contracting with a private vendor, but sometimes have been lacking in computer systems developed by State agencies. References that may be helpful when developing a computer system are listed at the end of this document.

PLANNING THE PROJECT

First, do a needs assessment. Clearly defining what you need will reduce the number and magnitude of project changes and revisions after the project is under way. A needs assessment involves examining current operations and deciding exactly what you want the new computer system to do. A good needs assessment includes an evaluation of the existing agency manual and computer business processes; new automation may be just one way to improve those processes.

If possible, have the needs assessment done by someone who is not trying to sell you a specific product. It is best to use an independent consultant, or in-house staff if they have the expertise, rather than a computer vendor. This can help ensure that the needs assessment is objective. Also, while computer vendors may give reasonable assessments, their knowledge may be limited to their own products and may not take into account other vendors' products that are more suited to your agency's needs.

Extensively involve those who will be using the computer system in all stages of planning and development. Administrators and managers often don't have a good sense of the day-to-day needs of the people who actually use the system. In the past, important pieces have been left out of systems because users were not involved.

Consider whether an existing software package will fit your needs. Computer vendors often have software packages that they have developed for agencies in other states. These packages often can be modified to fit your needs for less than it might cost to develop a system from scratch. Again, always involve the users in this assessment. Only opt for custom software, with its higher development and maintenance costs, when there is a clear business case for doing so.

Ensure that the system's infrastructure is adequate. Network design and capacity, data security, user help, data backup and storage, and disaster recovery all are important considerations. Also, system designers should develop standards for acceptable response times and other service levels. Those standards should be approved by the system's users.

SETTING THE PROJECT BUDGET

Establish a budget for each phase of the project and a budget for the total project. Always prepare a budget that considers staff time to be provided as well as dollars to be spent. A working budget provides a comparison of staff time spent and actual costs with planned time and expenditures. This tool provides accountability for staying within the budget, and a systematic basis for deciding whether to modify activities to control costs.

Be sure that all costs are included in the budget. Costs such as salaries and benefits of State personnel assigned to the project and costs of training agency personnel frequently are forgotten.

STAFFING THE PROJECT

Assign a full-time manager to the project with clearly defined responsibilities. Computer development projects are very complex and difficult to manage. The manager should not be expected to work on other agency projects while managing the development of a computer software project.

Give the project manager sufficient authority over the people and other resources provided for the project. A project manager cannot successfully complete a project if he or she has to compete with other managers for limited staff resources. The manager needs to know what resources have been committed to the project, and that they can be used as needed.

Ensure the in-house staff assigned to the project have the expertise needed to effectively carry out the role assigned to them. In the past, assigning inexperienced staff to projects has been a major reason why system implementation was delayed. In addition, on joint development projects, if an agency does not supply people with the necessary expertise to do certain tasks, contractors can claim that this affected their ability to complete the project on time.

Define the work and responsibilities of all project staff. This helps to make sure that tasks are not forgotten, and that everyone who works on the project knows what his or her responsibilities are.

Make sure project staff are able to devote the required time without being expected to fulfill their other full-time duties. A frequent mistake is to expect staff to work on a computer development project and fulfill their regular duties at the same time. This generally causes poor results in both areas.

<u>MAKING SURE THE AGENCY AND THE CONTRACTOR</u>
<u>KNOW WHAT WILL BE PROVIDED AND WHEN</u>

<u>Write detailed project specifications in your request for proposals and the final contract.</u> In the past, some agency contracts have not contained sufficient detail to specify exactly what the contractor was to provide. Because the contract language was so vague, the contractors were paid even though they had not provided a workable product.

<u>Evaluate proposals against the agency's needs assessment.</u> A common mistake is to compare proposed software systems against each other, instead of trying to get the best match with the agency's needs.

<u>Contract for completed products rather than "time and materials."</u> This helps control project costs and ensure that you receive the product you wanted. There have been cases where projects cost millions more than expected and the agency still did not receive a computer system that worked.

<u>When a contractor is used to develop software, make sure agency staff are familiar enough with the system to be able to maintain it.</u> This may eliminate the need to contract with the vendor to make minor modifications or adjustments to the system.

<u>Create a quality assurance review process.</u> The review process ensures the contractor delivers a product that meets the contract criteria before releasing payment. This step could save time and money that would be required to fix a non-working system later.

<u>Create project milestones and timeframes to be met by the contractor before releasing payment.</u> This helps ensure that the project stays on schedule.

<u>Specify realistic penalties for contractor non-performance or delays.</u> This also will help ensure that delays are kept to a minimum.

<u>Create a joint management team of outside consultants/vendor officials and State employees to make important policy decisions.</u> This combination of viewpoints and knowledge helps ensure that the best possible decision is made.

<u>OVERSEEING THE PROJECT</u>

<u>Involve top agency management.</u> Without top management support, the project may not have adequate staffing, or it may become overwhelmed by disagreements between departments.

<u>Require the project manager to make regular progress reports.</u> These reports should go to a management team or to the top agency managers. It is important that frequent reviews of the project progress be made so problems can be identified quickly, or avoided.

Address problems in software development or system configuration before moving on to the next step. Making sure each stage of development is done completely and correctly prevents costly time delays spent in diagnosing problems and rewriting programs at the end, when the system is much more complicated to unravel.

Top management should hire or assign a Project Architect to monitor the overall design of new systems. The Architect ensures that the system is designed to specifications and that it works with the existing agency structures. The Architect is a senior technician who prepares a plan for the entire scope of the project, including operations, networking, security, user help, and so forth. The Architect also monitors compliance with the plan.

Additional References

- Information Technology: A Model to Help Managers Decrease Acquisition Risks; United States General Accounting Office, August 1980.

- Executive Guide: Improving Mission Performance Through Strategic Information Management and Technology; United States General Accounting Office, May 1994.

- Information Resources: Summary of Federal Agencies' Information Resources Management Problems, United States General Accounting Office, February 1992.

SCOPE STATEMENT

Department of Revenue: Determining Whether the Department Took Adequate Actions to Implement Its New Motor Vehicle System

In 2009, the Department of Revenue awarded a $40 million contract to 3M Company to replace its aging motor vehicle mainframe systems. That project, referred to as the DMV Modernization Project, consolidated three older systems into one and is used to help track and issue driver licenses as well as process motor vehicle titles and registration. The first phase of the new computer system, the vehicle title and registration system, became operational in May 2012.

The first two months following the systems implementation has revealed several potential problems. Long delays at some county treasurer's offices for license and registration renewals—some as long as eight hours—have raised public concern about the functionality of the new system. Moreover, country treasurers throughout the state have mentioned concerns about the current system's lack of speed, data files being corrupted during conversion, and clerks being routinely disconnected from the system. As of June 2012, the department was still negotiating its contract with 3M because the system was not fully operational.

Legislators would like to know whether the department has adequately managed the implementation of its new motor vehicle system, and why county treasurer staff have had problems operating it.

A performance audit in this area would address the following questions:

1. **Did the department take appropriate actions to plan and oversee the implementation of its motor vehicle modernization project?** To answer this question, we would review documentation related to the development and testing of the computer system prior to its implementation in May 2012. We would determine what actions the department took to ensure the new computer program was properly developed and tested, and would compare those actions against relevant best practices. Specifically, we would determine whether potential security vulnerabilities and issues were addressed, whether the system was tested by potential users or other independent parties, whether problems were identified, and whether actions were taken to correct any noted deficiencies. We would also determine whether the department provided sufficient training opportunities to help county staff operate the new system. We would perform additional work in this area as necessary.

2. **What problems have county treasurers had operating the department's new motor vehicle system, and what are the causes?** To answer this question, we would survey and interview staff from all 105 county treasurers to identify significant problems they have had in operating the new computer system. For the problems they identified, we would gather more detailed information and documentation to better understand the exact nature of the problems. To the extent possible, we would use available department and county data to determine if those problems are a result of the current system or whether

they have always existed. We would work with county and department staff to determine how and why these problems occurred, and to determine what actions are needed to correct them. We would perform additional work in this area as necessary.

Estimated Resources:　3 LPA staff
Estimated Time:　　　4 months (a)

(a)　From the audit start date to our best estimate of when it would be ready for the committee. This time estimate includes a <u>two-week</u> agency review period.

COMMONWEALTH of VIRGINIA

Auditor of Public Accounts

WALTER J. KUCHARSKI
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March 30, 2011

Dr. Kim Luckes
Acting President
Norfolk State University
700 Park Avenue
Norfolk, Virginia 23504-8000

Dear Dr. Luckes,

We do not believe that Norfolk State University can successfully implement its Colleague system by July 12, 2011 as scheduled. Our Office monitors a variety of system development projects throughout the Commonwealth in an effort to reduce potential project failures. In conjunction with our financial statement audit, we reviewed your current implementation of the Colleague financial system.

We asked the Project Manager some basic questions in order to gain an understanding of the project and its progress; however, the responses provided led us to question the Project Manager's control over the project. For example, the Project Manager appears to have selected the July 12 implementation date based on when the University would like to have the system go live, rather than a date that considered what work remained and the staff available to do it. Without this type of analysis the Project Manager cannot know with any degree of certainty whether July 12 is a realistic, achievable goal.

In addition, the project team has no plan for how to handle the University's business operations and related data needs between fiscal year end at June 30 and the implementation date of July 12 or later. The Project Manager explained that upper management determined that Departments would not process transactions between these dates, but no formal plan exists outlining the process the University will follow and the risks involved with this plan. The Project Manager noted that the project is on track; however, if at any point she feels that the project is beginning to trend toward a later implementation date, she will address those issues immediately.

Finally, the Project Manager could not provide current plans or status reports and we have concerns because the project is less than four months away from its implementation. The Project Manager has not updated the project plan to reflect the current status of work or completed tasks since its original approval on January 31, 2011 and has not offered any other report or analysis that shows how the current work compares to the planned work at this time. As a result, we requested to attend project meetings but the Project Manager asked that we meet separately with her to discuss the project. Although we understand that our presence could possibly limit the candor of the project team, without project documentation, attending meetings is our best and most efficient way to understand how the project is proceeding.

The Project Manager's failure to adequately monitor and control the project creates risks affecting Colleague's successful implementation. Although the Project Manager believes the implementation is on schedule and Colleague will deliver as planned, we cannot independently validate this claim using the available project documentation.

The project documentation is missing critical information and deadlines normally necessary for successful project implementation as prescribed by the Project Management Institute's best practices. Attached in Appendix A, we provide greater detail and support regarding each of these missing critical components and what risk we have identified.

We recommend the Project Manager do the following.

1. Re-examine the project schedule and due dates and break the remaining tasks into smaller, more detailed and manageable units of work.

2. Assign specific team members to work on those detailed tasks rather than assigning tasks to a large, generic workgroup.

3. Examine team member assignments and availability to ensure they have the time availability to meet the completion of their tasks by a set deadline. Over committing team members in a given work week is setting them up to not deliver the completed task or make their deadlines.

4. Identify the tasks that create the critical path. The critical path is the series of tasks and deadlines that team members must complete for a project to finish on schedule. Identifying the critical path will allow the Project Manager to quantify how delays in completing critical path tasks affect the overall implementation date.

5. Establish a process to regularly and consistently collect actual team member hours worked on tasks and update, evaluate, and monitor task completion dates and the critical path. This monitoring process will allow the Project Manager to quickly determine when the project implementation date slips and adjust subsequent tasks or assign additional team members to bring the project back on schedule.

In late March, after providing a draft of this letter to the Project Manager, we met with the Project Manager to discuss our recommendations. The Project Manager explained that she is in the process of breaking the remaining tasks into smaller, more detailed and manageable units of work. We recommend the Project Manager continue implementing our recommendations and determine whether the July 12, 2011 implementation date is feasible and make adjustments as necessary.

Our intent with this letter is to contribute towards Colleague's successful implementation by providing recommendations that align with project management best practices.

If you have any questions regarding project management best practices or the recommendations outlined in this letter or Appendix A, please do not hesitate to call me or Tracy Surratt at (804) 225-3350.

Sincerely,

Walter J. Kucharski

cc: Mr. Edward L. Hamm, Jr., Rector

The Honorable Charles J. Colgan, Chairman
Senate Finance Committee

The Honorable Lacey E. Putney
Chairman, House Appropriations Committee

<center>**APPENDIX A**</center>

We do not believe that Norfolk State University can successfully implement its Colleague system by July 12, 2011 as scheduled, as a result of several project management risks outlined below. Our office monitors a variety of system development efforts throughout the Commonwealth. Our review goal is to detect problems at the earliest possible point and alert decision makers to this information, thereby reducing potential project failures. In conjunction with our financial statement audit, we reviewed your current implementation of the Colleague financial system.

Risk #1 – The Project Manager cannot effectively monitor and track project progress because she does not assign individual project team members directly to detailed tasks.

Best practice suggests that each task within the project schedule have at least one team member assigned and that project roles and responsibilities be clearly defined, preferably with no overlap of accountabilities. Further, only one person should be accountable for one assignment or multiple assignments, although any number of people may contribute towards those assignments. Two or more people should never have the same assignment as this leads to confusion and potential problems.

The Colleague Financials project plan shows tasks assigned to entire teams, rather than individual team members. In addition, the project plan assigns these teams at the summary task level, instead of assigning team members at the detailed task level as industry best practice recommends. By assigning entire teams to summary tasks, the Project Manager has no means of determining if sufficient project team members exist to complete the tasks on time.

For example, the project manager has assigned to two teams, the Core Team and Datatel, the summary task "Map IFAS processes to Colleague." This summary task spans 124 days and totals over 3500 hours of work. The Core Team has approximately a dozen individuals and the documentation does not explain how many individuals work on the Datatel team. The project documentation does not indicate the amount of time each team member must work on this task or the individual team member's availability. In addition, the individual detailed tasks that roll up to create the summary task, "Map IFAS processes to Colleague", have no teams or team members assigned to them.

Since receiving a draft of our recommendations, the Project Manager has begun to identify owners of each task. However, she needs to identify other team members and the amount of hours that they are expected to contribute to those tasks. This lack of detail prevents the Project Manager from using a best practice process called leveling, to determine if team members are being assigned more work than is feasible by the task due date. When a team member is over-allocated, he is assigned to work more hours than possible in a workweek. When under-allocated, he may finish tasks earlier than estimated and have downtime until his next task begins. The majority of the Colleague Financials project team is concurrently managing their regular work assignments while working on the implementation. This dual responsibility makes leveling the project even more important to ensure sufficient staff exists for a timely implementation.

We recommend the Project Manager assign individual team members to detailed tasks and level the work to determine if sufficient team members exist in order to complete the project by the July 12, 2011 implementation date.

Risk #2 – The Project Manager cannot monitor the impact of late tasks on meeting the implementation date because she does not break tasks down into small units of work.

Project management best practices recommend that the project manager break down project schedule tasks to the lowest possible level of work. Generally, no task should take longer than 80 hours to complete. This level of detail allows the project manager to monitor and control each task and make adjustments to the schedule and plan when tasks are late. Further, it gives the assigned team members a clear understanding of what they need to do to accomplish the task.

Our review of the project plan shows the current tasks define large groups of work that are often several hundred days in duration. In addition, the tasks are generic and lack the specification needed to adequately define the scope of the work. Vague tasks can lead to scope creep, as well as a product that does not meet the desired outcome.

For example the task, "Develop Payroll (CIPPS) Interface" had a schedule of 90 days to implement and involves both the Core Team and Datatel. However, the project plan does not identify the detailed tasks and duration of each task to support the 90 days summary level duration. In addition, as mentioned previously under Risk 1, the project plan did not identify which of the Core Team will work on the interface development and what level of involvement each member will have.

Since receiving a draft of our recommendations, the Project Manager has worked with the project team to begin breaking the tasks into more manageable units. She should now work to identify the project's critical path which will allow her to determine early on, whether delivering tasks late will affect the implementation date. The critical path is the series of tasks that dictates the calculated end of the project. If a single task is late on the critical path, the end date of the entire project will also be late.

As an example, when building a house, the contractor cannot build the walls until contractor completes the foundation. Likewise, the contractor cannot add the roof until contractor builds the walls. Each of these activities are in the critical path and a delay in one, such as pouring the foundation late, will impact the start date of the other, such as the day the walls can be built. The critical path can change from one series of tasks to another as you progress through the schedule; therefore, closely monitoring critical tasks is essential.

We recommend that the Project Manager continue to work with the project teams to break the remaining summary level tasks into smaller, more detailed and manageable units of work and assign team members to work on them. This will allow the Project Manager to identify the critical path and better monitor task completion so she can respond by adjusting the schedule and requesting additional team members to minimize the impact of late tasks on the scheduled systems implementation date.

Risk #3 –The Project Manager cannot monitor the project's schedule because she does not regularly collect information from team members such as hours worked on tasks and estimates to complete tasks.

Continuous monitoring gives the project management team insight into the health of the project and identifies areas that require special attention. Monitoring allows for the implementation of corrective and preventative actions that will positively affect the final project implementation. Monitoring includes collecting, measuring, and disseminating performance information and assessing trends through the project duration. Best practices recommend developing a project plan early in the project and managing the project to the plan.

As management tracks project progress, they can review the differences between planned, scheduled, and actual work. The actual work is the amount of work performed on a task or assignment. This helps management assess whether work on the project is progressing as expected. The Project

Manager must maintain the project plan in order for it to be an effective tool to monitor the project's progress.

Although the Project Manager assures us that the project is on schedule and will meet its scheduled completion date, we cannot rely on the project data provided to verify the scheduled progress and completion of work. The Project Manager has not provided evidence that she is regularly collecting detailed information from the project team regarding actual hours worked and remaining time required for each task. In addition, the Project Manager has no process to regularly update and maintain the project schedule. Infrequent updates make it difficult for the Project Manager to determine the impact of late tasks on the implementation date and to devise a plan to respond.

We recommend that the Project Manager develop a process to regularly collect from team members the actual hours worked on each task, estimate remaining work by task, and update the project plan to include that information. We recommend the Project Manager follow a disciplined approach with regular updates of the project plan and regular monitoring such as weekly, and use analysis reports to review the status often. The project plan and its analysis are management's most effective tools to indicate the status of the project.