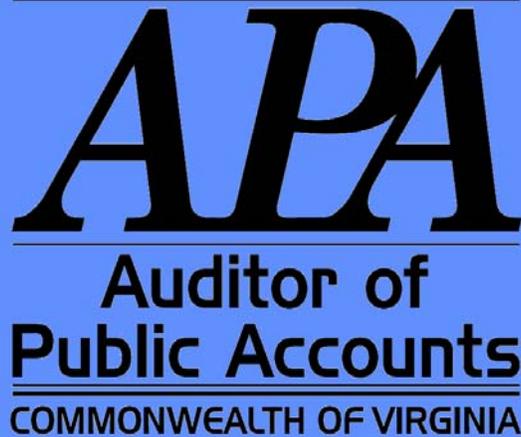


**INTERIM REVIEW OF STARS PROJECT**

**APRIL 2009**



## **AUDIT SUMMARY**

We completed our second interim review of the State Police Project Management Team's oversight and administration of the Statewide Agencies Radio System (STARS) Project. The STARS project includes a \$338 million agreement with Motorola to design and install a new state of the art telecommunications and radio system for the Virginia State Police and 20 other agencies of the Commonwealth. Our office monitors the status of major Commonwealth projects such as the Statewide Agency Radio System to help identify and prevent failures related to project management in order to minimize loss to the Commonwealth.

The State Police have completed all of our recommendations from our prior review to the extent possible, but we have concerns about the future funding of this project, including its future operation and maintenance requirements. Until the STARS project team can "lock down" all tower sites, the project schedule is on a day for day delay. This situation has caused a delay of 140 days as of the end of February 2009.

Based upon estimates by STARS management and our estimate of the continued overhead charge for Motorola each day they remain on the project, we calculate a residual bond proceed balance of \$3.7 million upon the completion of the project. This estimate assumes that there will be no further change-orders, delays, or increased construction or engineering costs. Further, with no source for funding the continued operability of the completed system, State Police risks not being able to operate its new radio system properly after installation.

We recommend throughout the report that STARS management:

- Develop a complete cost of maintaining the system after project acceptance and identify a method of financing or providing the necessary maintenance to ensure future system operability.
- Improve the controls for paying the project consultant to ensure that State Police receives complete and appropriate documentation supporting the billings prior to making payment.
- Continue to follow best practices in the execution, control, and close-out of the project in order to ensure the quality of the final system.

- TABLE OF CONTENTS -

	<u>Pages</u>
AUDIT SUMMARY	
STARS PROJECT	1-9
AUDIT OBJECTIVES	10
AUDIT SCOPE AND METHODOLOGY	10-11
CONCLUSION	11
EXIT CONFERENCE	11
AGENCY RESPONSE	12-15
AGENCY OFFICIALS	16
APPENDIX A: SCHEDULE OF PROJECT CAPITAL SOURCES AND USES	17
APPENDIX B: SCHEDULE OF PROJECT OPERATING SOURCES AND USES	18-19
APPENDIX C: BEST PRACTICES FROM THE PROJECT MANAGEMENT BODY OF KNOWLEDGE (PMBOK)	20-21
APPENDIX D: COMPARISON OF STARS PRACTICES TO BEST PRACTICES	22-24

## STARS PROJECT

### Background

In July, 2000 the Virginia State Police began its effort to replace their existing statewide land mobile radio system originally installed in 1977. The Statewide Agencies Radio System (STARS) project will replace the existing analog radio system with a modern digital radio system which will improve interoperability with Commonwealth agencies charged with emergency response duties, local governments, and federal agencies. The interoperability solutions within STARS will allow each locality, at the county and city level, to communicate with users independent of their technology or radio frequency band.

Twenty-one agencies are committed to participating in the STARS project as they will directly benefit from sharing and using the technology and network developed under STARS. The Governor designated the State Police as the lead agency for this project. Table 1 lists the 21 participating agencies on the STARS project.

Table 1

Chesapeake Bay Bridge Tunnel	Department of Game and Inland Fisheries
Department of Alcoholic Beverage Control	Department of Health
Division of Capitol Police	Department of Juvenile Justice
Department of Charitable Gaming	Department of Military Affairs
Department of Conservation and Recreation	Department of Mines, Minerals, and Energy
Department of Corrections	Department of Motor Vehicles
Department of Emergency Management	Department of State Police
Department of Environmental Quality	Department of Transportation
Department of Fire Programs	Virginia Information Technologies Agency
Department of Forestry	Virginia Marine Resources Commission
	Virginia Port Authority

### Project Inception

On July 1, 2000, the Commonwealth, through the Department of General Services, awarded a consulting contract to Hayes, Seay, Mattern & Mattern, Inc. and its communications subsidiary, AECOM Services, Inc. dba AECOM Design (Formerly Hayes, Seay, Mattern & Mattern, Inc. and its communications subsidiary, CTA Communications). CTA provided technical consulting for the design of a modern communications network for the Commonwealth, which served as the basis for a Request for Proposal for a new communication system issued on August 1, 2001. AECOM Services, Inc. dba AECOM Design (Formerly Hayes, Seay, Mattern & Mattern, Inc. and its communications subsidiary, CTA Communications) continues to provide project management, inspection, and quality control support to State Police.

In response to the Request for Proposal, State Police received a proposal only from Motorola. State Police evaluated the response and began negotiations with Motorola. The final negotiated system cost was \$329,895,699 and on June 23, 2004, the Commonwealth signed the contract. The negotiations also resulted in State Police assuming responsibility for the following activities:

- renovating a warehouse at State Police Headquarters to serve as the Network Operations Center;
- constructing a new building at the Division Six Headquarters in Salem to serve as a master site for the western portion of the state; and
- purchasing all of the software for the laptop computers through the VITA contract with Microsoft, where applicable.

## PROJECT OVERVIEW

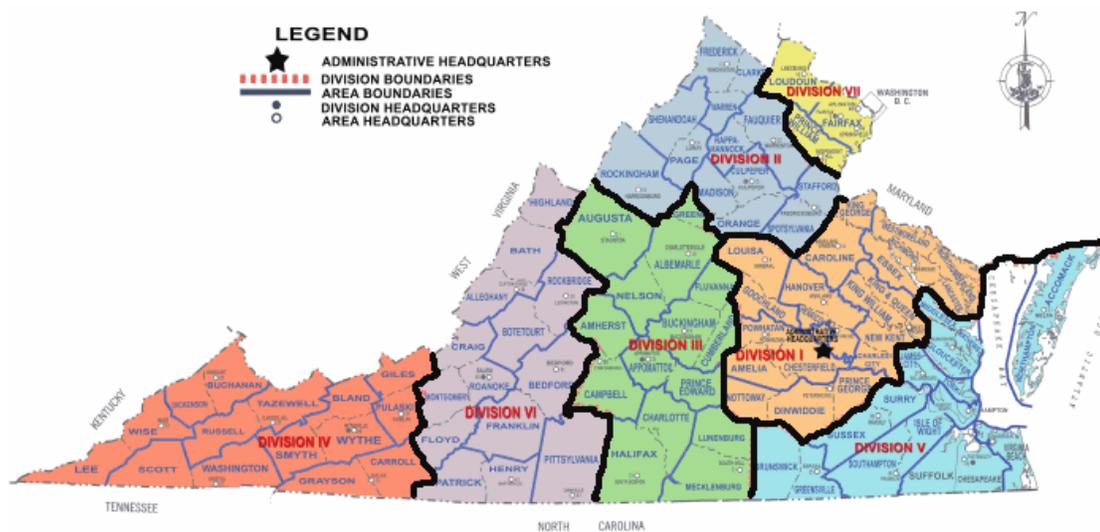
### Project Scope

The STARS contract includes a number of components to enable statewide communication for emergency services. The contract requires Motorola to construct or improve a number of site towers including installation of all of the necessary communications equipment to allow system operability. Motorola is also responsible for supplying vehicle equipment, including new laptops for each fleet vehicle. Motorola is responsible for delivering a completely integrated and functioning communication network, which includes acquisition of the necessary bandwidth frequencies and providing training on the use and maintenance of the system.

### Project Status

According to Motorola as of February 17, 2009, First Division is 100 percent complete, Fifth Division is 85 percent complete, Second Division is 85 percent complete, Third Division is 62 percent complete, Seventh Division is 84 percent complete, Sixth Division is 80 percent complete, and Fourth Division is 62 percent complete. Motorola also provides that subscriber migration is 75 percent complete, training of STARS users on new equipment is 57 percent complete, and mobile DATA integration is 22 percent complete.

The following is the implementation schedule for the various divisions under both the original schedule and the accepted assumptions.



Division	Original Planned Completion Date	Current Planned Completion Date
Div 1 – Richmond	June 2006	March 2007 (Actual)
Div 5 – Tidewater	May 2008	April 2009 <sup>A</sup>
Div 2 - Culpepper	July 2008	April 2009
Div 7 - Northern Virginia	October 2008	March 2010
Div 6 - Salem	April 2009	August 2010
Div 3 - Appomattox	May 2009	August 2009
Div 4 - Wytheville	September 2009	August 2010

Notes: A – The Tidewater Division was substantially completed in June 2007, however there are punch-list items that must be completed before final acceptance of Division 5 can take place. The date above reflects the anticipated final acceptance.

### Scheduling and Project Delays

The ability to complete the project on-time and on-budget remains a concern. STARS management re-base lined the project schedule in July 2008, changing the project's final acceptance date from September 2, 2009 to April 23, 2010, which was a change of 158 work days. The project has since experienced further delays and as of March 1, 2009, is 140 days off the re-base lined schedule. This delay will likely push the project's final acceptance into early 2011. Below are two of the most significant impediments to the timely completion of the project.

#### *Site Lock-Down*

As of March 1, 2009, out of the 117 total tower construction sites, 11 are not yet locked-down for various reasons. A site is "locked down" once State Police has the right of way, lease or title, building permits, frequency permits, and network designs necessary to allow for the beginning of construction. The project will continue to experience a day-for-day slip in the schedule for every day there is no "lock down" of the remaining 11 sites.

Our prior review found that STARS management did not always use realistic scheduling assumptions when scheduling future construction and installation work. STARS management required Motorola to develop the schedule based on the Commonwealth's work week and state holidays, however, there are other assumptions built into the schedule which are unrealistic but cannot yet be determined. For example, the schedule continues to assume that all sites are locked-down, when they are not. The Project Manager has decided to make no assumptions related to the locking-down of these sites. Instead, once the "lock down" of the sites occurs, it will become a priority for both STARS and Motorola teams to bring the schedule in closer to the original proposed completion date.

#### *Laptop Failures and Vehicle Installations*

STARS management is currently working to resolve an issue with the laptops Motorola is providing for use in the vehicles with STARS. The laptops are failing up to 30 percent in multiple hardware tests. Because of the hardware failures, STARS management has ceased installation of new laptops into vehicles because the rate of failure does not meet the contract specifications. Currently, Motorola is presenting different solutions to STARS management. However, Motorola may have difficulty providing an acceptable solution to this problem since Motorola is phasing out their laptop hardware division.

Should Motorola present an acceptable solution, implementation and installations can continue, but if not, there could be many different issues arising from this situation. Currently, vehicle installations are not on the critical path, but if this issue continues to go unresolved, project delays could occur as well as extra project costs and possible legal actions, which could further delay the project.

### Estimated Cost of Delays

Based upon the current schedule and the fact that tower site lock-downs have not yet occurred, STARS management accepts that there will be a project delay. The estimated cost to complete report prepared by STARS management has already made provisions for the re-base lining of the schedule, but as there is now an estimated and continually growing 140 day delay, additional costs should be expected.

Based on the contract, the rate to keep the Motorola Project Team on this project is roughly \$16,835 per day. At this rate, the extra 140 days that this project will need to be completed will cost an extra \$2.36 million dollars. These estimated costs come before incurring any other extra costs for work completed on the project.

The cost per day is a calculation based upon the quarterly project office allocation payments to Motorola per the contract and does not include any additional resources that Motorola may or may not need to complete tasks during the day-for-day delay period as the auditors, we cannot estimate these costs.

The total bonding authority of \$361.2 million reduced by the estimated costs to complete the project and by the extra estimated costs due to project delay alone leave an estimated remaining capital funding after project completion of \$3.7 million under the assumption that no further change-orders will occur.

Total Bonding Authority	\$361,200,000
Less: Original Contract commitment	(329,673,698)
Less: Change Order Costs	(10,052,584)
Less: VSP Estimated Additional Costs to Complete Project	(15,411,993)
Less: Estimated costs based on schedule delay of 140 days for Motorola Project Office costs (\$16,835/day)	<u>(2,356,900)</u>
Remaining capital funding assuming no further change-orders	<u>\$ 3,704,825</u>

Under the assumption that there will be no future change orders to the contract with Motorola and no future capital expenses incurred by State Police outside of the scope of the Motorola contract, the project has sufficient funding. However, if change orders to the Motorola contract and additional capital expenses above and beyond that committed to Motorola continue to increase at the rate that they have over the past four years, the Project Management Team could exhaust its capital funding before the project is complete.

**Recommendation 1: Continue Monitoring Project Financing**

STARS management should continue to track the incurred costs, estimated costs, future change orders, and the project budget to ensure that the project does not exhaust its capital funding before the project is complete. Historical increases coupled with known delays and issues makes monitoring a high priority for management.

PROJECT FINANCING

Project Financing - Capital

Funding for the capital portion of the STARS project uses revenue bonds authorized by the General Assembly. Chapter 522, Virginia Acts of the Assembly – 2004 Session, authorized the Virginia Public Building Authority to issue the initial \$159,300,000 in revenue bonds for Phase I of the project. Repayment of these bonds would come from an increase in the tax on rental vehicles within the Commonwealth. Chapter 245, Virginia Acts of the Assembly – 2006 Session, authorized an additional bond issue in the amount of \$201,900,000 for Phase II of the project. To date, the Commonwealth has issued revenue bonds amounting to \$245,900,000 with \$115,300,000 of remaining bond authorization.

Expenses against the major contract with Motorola total \$222.8 million through December 31, 2008. This represents 67.6 percent of the current contractual amount. In addition to the contract with Motorola and the internal project management costs of State Police, the STARS project has issued contracts or purchase

orders with a number of other vendors for facility construction, frequency licensing, and computers and computer software. Capital payments to other vendors related to the STARS project totaled \$12.3 million through December 31, 2008.

The second and third largest capital contracts are with G & H Contracting and W M Schlosser, Inc., respectively. These contractors are the primary construction contractors for the renovation and construction of the State Police Headquarters Network Operations Centers (NOC) in Richmond and Salem. W M Schlosser, Inc. completed the renovation of the Division 1 NOC at a total cost of \$3.2 million. G & H Contracting completed the construction of the Division 6 NOC at a cost of \$3.4 million.

Through December 31, 2008, STARS management expended 64.9 percent of the total capital bonding authority and still has five out of seven Divisions of the State Police to complete. For a schedule of capital sources and uses see Appendix A.

Project Financing - Operating

The State Police will pay for consulting, management, testing, inspection, and other operating costs with General Funds specifically designated for administration of the STARS project. The following is the General Fund appropriation by year for this project.

<u>Fiscal Years and Funded Agency</u>	
2003-2004 – State Police	\$ 3,000,000
2005 – State Police	2,510,000
2005 – Department of Forestry	123,599
2006 – State Police	2,510,000
2006 – Department of Forestry	244,359
2007 – State Police	2,510,000
2008 – State Police	2,510,000
2009 – State Police	<u>2,510,000</u>
Total General Fund Appropriations	<u>\$15,917,958</u>

Since the first appropriation for STARS operating expenses in fiscal year 2003, the project has spent \$14 million through the first half of fiscal year 2009, of which \$5.6 million are payments to AECOM for technical consulting and \$4.7 million covers STARS management salaries. For a schedule of operating sources and uses see Appendix B.

Future Project Operational and Maintenance Costs

With any project it is the project manager’s responsibility to inform stake-holders of the continued cost of maintaining or operating the completed project. The project manager should make the operational and maintenance costs part of the total cost of the project, as soon as there are reasonable estimates available. Disclosing operational and maintenance costs during the project allow management to ensure that sufficient funding will be available to support the project after completion for the remainder of its useful life.

STARS management does not have the funding to pay for the future costs of operating and maintaining the STARS system. The current estimates created by STARS management and the project consultant state that there is a need for anywhere between \$9 and \$18 million per year before paying for any

land leases used for the STARS system. Current funding for the STARS project may be sufficient to cover construction and implementation, but does not include any funds for the continued maintenance of the system.

Currently we estimate \$3.7 million of funding in excess of the estimated cost to complete the project. Even if there are no further cost increases above the estimated cost to complete the project, the remaining funding for the construction of the system will not be sufficient to cover maintenance and operations for one year. STARS management will not have the funding to repair, operate, and ensure the continued operability of the STARS system beyond project acceptance.

This situation has occurred because STARS management did not identify the need for additional funding for the future costs of this project. STARS management has an estimate from the project consultant that includes the maintenance and personnel costs, but this estimate excludes the future lease obligations.

Project management best practices suggest that all future maintenance and operating costs for any given project be part of the total cost of the project for funding purposes. As such, all project stakeholders during the planning phase of the project would know the entire estimated cost of maintaining an operational system. STARS management has not yet analyzed existing resources within their current operating budget that might absorb a portion of the continued cost of operating the new system, nor have they made a determination as to the amount of any external funding that might be necessary to fund system maintenance and operations.

**Recommendation 2: Develop a Plan to Ensure Continued System Operability**

STARS management should review the current estimates prepared by their consultants for the continued costs of maintaining this system and ensure that the estimate includes all costs necessary to operate the system. Management should then make an assessment as to how much of the necessary maintenance they can absorb within their current operating budget. STARS management should identify its funding needs and inform all project stakeholders immediately if they cannot support continued maintenance of the system under the current operating budget.

Project Consultant

AECOM Design through its subsidiary CTA Communications is the technical consultant to the State Police and continues to provide the technical communications expertise and monitoring to ensure the system will meet the current and future needs of the Commonwealth. The State Police have issued and approved nine change orders with AECOM Services, Inc bringing the estimated final cost of the consulting engineering services to \$19,970,706.

STARS management makes payments to AECOM without receiving or reviewing sufficient evidence supporting the invoices. The State Police pays AECOM on a schedule of rates for the individual consultants who work on this project. STARS management makes monthly payments to AECOM equal to the amount invoiced based on monthly work reports provided by the AECOM. Neither of these two items provides clear evidence to STARS management as to how many hours each consultant charged to the project for the period. STARS reviews monthly work reports to ensure that AECOM provides required reports and has attended relevant meetings but is making payments without knowledge of actual billable hours worked by the consultants.

Because STARS management does not have adequate evidence to support payment of consultant invoices, they may have overpaid the consultant and the potential for future overpayments exists. The payment rates for AECOM employees working on this project vary from \$56 per hour to \$182 per hour.

However, as AECOM does not provide a detailed breakdown of the consultants who worked during the billing period and for how many hours they worked, STARS management cannot validate the accuracy of consultant invoices.

**Recommendation 3: Increase Oversight of Consultant Payments**

STARS management should obtain detailed reports of the hours charged from the consultant, so they can complete a review of the charges on each invoice before making payment. STARS management should obtain this breakdown directly from AECOM with the monthly work report to provide support for the work items laid out in the report. STARS management should also request past hourly reports to ensure that no inaccurate payments occurred since starting this contract.

**PROJECT MANAGEMENT BEST PRACTICES**

Throughout our review we compared generally accepted best practices from the Project Management Body of Knowledge (PMBOK) as they relate to project integration, scope, time, cost, quality, communication, and risk management to those practices followed by STARS management. The results of our follow-up of STARS managements' adherence to project management best practices follow. Additionally, Appendix C describes the Best Practices used during the evaluation from the Project Management Body of Knowledge (PMBOK) and Appendix D summarizes the results of our comparison between best practices and those used by STARS management.

Project Management - Organization

STARS management is under the command of the State Police Bureau of Administrative and Support Services Lieutenant Colonel. The Captain of the Property and Logistics Division of State Police provides STARS management with his staff and is the acting Project Director. The Captain of the Communications Division provides the inspection and engineering staff responsible for the testing of hardware deliverables.

In response to our last audit, STARS management added a full-time Project Manager to take the place of the lead VSP engineer who formerly served as Project Manager. The new Project Manager is responsible for the project and is accountable to resolve the issues encountered during the earlier stages of the project and to guide the project to final acceptance as efficiently and effectively as possible.

The Project Manager and the Project Director share responsibility for decision making, however the Project Manager has expanded authority to make decisions impacting the project. This situation differs from the decision making structure in place during our previous review in which the two Division Commanders had final authority. As the Project Manager is serving under the Property and Logistics Division, all decision making ultimately comes from this Division. The Communications Division provides input into the project as does the consultant and others on the Management Team from within the Property and Logistics Division. However; the Project Manager and the Project Director make all project decisions, which simplifies the decision-making process and provides greater accountability for the project.

### Project Management – Communications

Communications within STARS management and between State Police and their contractors resulted in a finding in our previous review. Communications suffered from the project management structure that was in place and this resulted in involved parties not having all of the relevant and needed information for decisions and untimely communication.

By hiring a Project Manager and reorganizing the decision making structure of the project, communication within STARS management and with the two contractors has improved. The Project Manager implemented a new Communication Plan laying out the recipients of each type of information that STARS management distributes. The new Communication Plan also uses a transmittal procedure to ensure that all documents that need to be official and sent out to others are documented and logged to ensure recipient receipt. The new Communications Plan has allowed for internal and external communication to provide the information needed to make decisions to the decision makers in a timely manner. The enhancements to the Project Communication Plan are comparable to best practices in the Project Management Body of Knowledge.

### Project Management – Resource Planning

Our prior review found that STARS management did not adequately allocate State Police resources for long term needs. STARS management relies on the work schedule that Motorola creates for scheduling its inspection of deliverables. The new Project Manager has implemented a 30/60/90 day resource scheduling plan to ensure that any delays will not result from STARS management scheduling issues. This plan allows STARS management to schedule resources more efficiently and effectively. The Project Manager has a monthly schedule that shows where each inspector is going to be for the immediate month, and it also describes what resources will be needed in the intermediate future and in the long-term.

### Project Scheduling and Budgeting

Our prior review found that STARS management was not adequately tracking actual project costs and a reasonable estimate of the cost to complete the project against an established budget. Both of these items are necessary to allow STARS management to assess whether or not the project is on budget and whether the funding available is sufficient to complete the project.

STARS management addressed these findings by calculating an estimated cost to complete and developing a method for tracking actual costs incurred against the project budget. The estimated cost to complete has outlined the original contract costs and has also included estimated extra costs based on previous work completed earlier in the project. The estimate, including prior costs-to-date, as of the end of December 2008 totals \$355,150,000. This leaves a projected remaining balance of bond funds of roughly six million dollars. However, this does not account for the current delay we estimate in the Project Financing Section above.

Motorola maintains the project schedule of activities for the STARS project. Motorola, during project scheduling meetings, obtains input and guidance from STARS management on scheduling assumptions and current status. Management relies on Motorola to update and maintain the project schedule. However, since our last review, STARS management has developed their own resource schedule to independently track overall project status through the use of budget to actual reports as well as the Primavera Pro-Sight system.

**Recommendation 4: Continue to Follow Best Practices in Project Management**

Generally, STARS management has adopted those best practices in project initiation and planning since VITA PMD requires them for adoption of the project. STARS management has made changes since our prior review which have resulted in improved project management. While STARS management has met more of the best practices and have improved their project management, they should continue to be diligent in following best practices in the execution, control, and close-out of the project.



# Commonwealth of Virginia

**Walter J. Kucharski, Auditor**

**Auditor of Public Accounts  
P.O. Box 1295  
Richmond, Virginia 23218**

April 15, 2009

The Honorable Timothy M. Kaine  
Governor of Virginia  
State Capital  
Richmond, Virginia

The Honorable Thomas J. Norment  
Chairman, Joint Legislative Audit  
and Review Commission  
General Assembly Building  
Richmond, Virginia

We have completed an interim review of the **Virginia State Police (State Police) management of the Statewide Agencies Radio System** project, and submit our report entitled, "Interim Review of STARS." We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The STARS implementation is a six-year, \$338 million agreement with Motorola to design and install a new state of the art telecommunications and radio system for the Virginia State Police and twenty other agencies of the Commonwealth. Our office monitors the status of major Commonwealth contractual commitments such as the Statewide Agency Radio System to help identify and prevent failures related to contract management in order to minimize loss to the Commonwealth.

## Audit Objectives

Our objectives for the review of the STARS project were to determine whether:

- STARS management adequately monitors the project progress to ensure Motorola's compliance with the contract specifications.
- Payments made to the project consultant are reasonable and substantially supported.
- STARS management is adequately planning for the future costs and schedule of the project.
- STARS management is spending its funding in a controlled and responsible manner with regards to the remaining funding for the project.

## Audit Scope and Methodology

Our review examined the management of the STARS project, including the contractual agreement between State Police and Motorola and agreements between State Police and AECOM Services, Inc. Our

review focused on project oversight activities to date with an emphasis on project schedule management, project budget management, project communication, project funding, and contract change controls.

Our work consisted of management inquiries; examination of contractual agreements, project budget, and project schedule; review of current procedures; review of invoice and receipt documentation; and attendance at STARS Progress and Schedule Review meetings to track implementation progress.

### Conclusion

Overall, we found that STARS management adequately monitors the project progress to ensure Motorola's compliance with the contract specifications. We cannot make a determination as to whether payments to the project consultant are reasonable as there is not sufficient evidence to support the invoices. STARS management did not adequately plan for the future cost of maintaining the project and risks inoperability after completion. Since our last review, STARS management is spending its funding in a controlled and responsible manner with regards to the remaining funding for the project.

### Exit Conference and Report Distribution

We discussed this report with Virginia State Police's management at an exit conference on May 1, 2009. Management's response has been included at the end of this report.

This report is intended for the information and use of the Governor and General Assembly, management, and the citizens of the Commonwealth of Virginia and is a public record.

AUDITOR OF PUBLIC ACCOUNTS

AWP/clj



# COMMONWEALTH OF VIRGINIA

Colonel W. S. (Steve) Flaherty  
Superintendent

(804) 674-2000

## DEPARTMENT OF STATE POLICE

P.O. Box 27472 Richmond, Va. 23261-7472

Lt. Colonel Robert B. Northern  
Deputy Superintendent

May 12, 2009

Mr. Walter J. Kucharski  
Auditor of Public Accounts  
P. O. Box 1295  
Richmond, Virginia 23218

Dear Mr. Kucharski:

Auditors from your office completed an interim review of the State Police Project Management Team's oversight and administration of the Statewide Agencies Radio System (STARS) Project. The STARS project includes a six-year, \$338 million agreement with Motorola to design and install a new state of the art telecommunications and radio system for the Virginia State Police and 20 other agencies of the Commonwealth.

The results of the review were discussed with Virginia State Police's management at an exit conference on May 1, 2009. Included are the responses to the four audit recommendations.

The auditors that conducted the review were competent and helpful. I am confident that working together the management of the STARS project can be completed and closed out in an efficient manner. The recommendations made during the review have provided the guidance to keep the project successful. Any questions may be directed to Lieutenant Colonel Robert G. Kemmler at (804) 674-4606.

Sincerely,

  
Superintendent

WSF/MEB

Attachment

**Virginia State Police  
Statewide Agencies Radio System  
(STARS)  
Audit Responses - April, 2009**

**Recommendation 1: Continue Monitoring Project Financing**

*STARS management should continue to track the incurred costs, estimated costs, future change orders, and the project budget to ensure that the project does not exhaust their capital funding before the project is complete. Historical increases coupled with known delays and issues makes monitoring a high priority for management.*

**Response:**

STARS management calculated an estimated cost to complete and developed a method for tracking actual costs incurred against the project budget. The estimated cost to complete has outlined the original contract costs and has also included estimated extra costs based on previous work completed earlier in the project. The estimate, including prior costs-to-date, as of the end of December 2008 totals \$355,150,000. This process will be maintained, providing a running total of funds expended and will continue to track the cost of change orders. The maintaining of the ongoing cost to complete the STARS project is a high priority.

**Recommendation 2: Develop a Plan to Ensure Continued System Operability**

*STARS management should review the current estimates prepared by their consultants for the continued costs of maintaining this system and ensure that the estimate includes all costs necessary to operate the system. Management should then make an assessment as to how much of the necessary maintenance they can absorb within their current operating budget. STARS management should identify its funding needs and inform all project stakeholders immediately if they cannot support continued maintenance of the system under their current operating budget.*

**Response:**

Hayes, Seay, Mattern & Mattern, Inc. through its subsidiary AECOM Services, Inc. is the technical consultant to the State Police for the STARS Project. They prepared a projected cost to maintain the STARS network. This estimate serves as a foundation to proceed with a decision package through the Department of Planning and Budget for the 2010 General Assembly to address funding to maintain the STARS network.

The Department has a Communications Division staffed with engineers and technicians that maintain the Department's current communications network. The plan is to have the Communications Division personnel maintain the STARS network post warranty. The engineers and technicians have already received extensive training from Motorola to ensure they are able to maintain the STARS network. This training is ongoing. The contract with Motorola provides the test equipment and spare parts to maintain the vehicular and network communications equipment.

A STARS garage has been funded and is in the design phase. This garage will be sufficient to maintain the vehicular STARS radios for the twenty-one (21) state agencies that participate in the STARS Program.

The STARS stake-holders will remain involved in the development of the plan to maintain the STARS network.

### **Recommendation 3: Increase Oversight of Consultant Payments**

*STARS management should obtain detailed reports of the hours charged from the consultant, so they can complete a review of the charges on each invoice before making payment. STARS management should obtain this breakdown directly from AECOM with the monthly work report to provide support for the work items laid out in the report. STARS management should also request past hourly reports to ensure that no inaccurate payments occurred since starting this contract.*

#### **Response:**

The STARS managers met with AECOM on March 18, 2009, to address the above recommendation. The original Consultant Contract was awarded by the Department of General Services as a schedule of values contract. The Consultant would give us a level of efforts against their assigned tasks and bill the Commonwealth accordingly, based upon only the completed tasks. During the managers' meeting AECOM showed working documentation on how their invoices are created. It was agreed that beginning with the upcoming April, 2009 invoices, AECOM will also submit in electronic format all of their working documentation to support their invoices. We have experienced numerous years where CTA/AECOM did not utilize all of their allocated funds because no work was performed or required. During those times, the Consultant did not submit any invoices for services. They only bill for completed tasks performed. STARS management will begin performing a thorough review of supporting documentation before any new Consultant invoices are processed. If additional data is needed, it will be requested to complete the review. We have asked our Consultant to also provide supporting documentation for all invoices that have been issued for Fiscal Year 09. Upon receipt, we will audit this documentation for previous invoice verifications.

**Recommendation 4: Continue to Follow Best Practices in Project Management**

*Generally, STARS management has adopted those best practices in project initiation and planning since VITA PMD requires them for adoption of the project. STARS management has made changes since our prior review which have resulted in improved project management. While STARS management has met more of the best practices and have improved their project management, they should continue to be diligent in following best practices in the execution, control, and close-out of the project.*

**Response:**

STARS management added a full-time Program Manager. The new Program Manager is responsible for the project and is accountable to resolve the issues encountered and to guide the project to final acceptance as efficiently and effectively as possible. The Program Manager will continue to use the practices from the Project Management Body of Knowledge (PMBOK) as they relate to project integration, scope, time, cost, quality, communication, and risk management. He will continue to keep management informed of progress and issues.

The continued implementation of the project is the highest priority, being ever mindful of financial and schedule impacts as they relate to the cost to complete. The project close-out is also a priority, with activities underway to ensure close-out is achieved in a timely manner.

DEPARTMENT OF STATE POLICE

Colonel W. Steven Flaherty  
Superintendent

Lt. Col Robert G. Kemmler  
Director, Bureau of Administration  
And Support Services

Capt. Michael E. Bolton  
STARS Program Director

OFFICIALS

John W. Marshall  
Secretary of Public Safety

Aneesh P. Chopra,  
Secretary of Technology

Schedule of Sources and Uses - STARS Capital  
 From July 1, 2005 to December 31, 2008

APPENDIX A

Capital Sources:

Revenue bonds issued	\$ 245,900,000	
Unissued bonding authority	<u>115,300,000</u>	
Total sources	<u>361,200,000</u>	100%

Capital Sources:

Motorola contract	222,032,937	
W M Schlosser Inc.	3,237,776	
G&H Contracting	3,430,143	
Hayes, Seay, Mattern, & Mattern, Inc.	1,529,655	
Redi Call Communications	1,355,000	
Federal Communication Commission	878,405	
Other Miscellaneous Vendors*	<u>1,860,539</u>	
Total uses	<u>234,324,455</u>	64.9%

Net remaining funding at December 31, 2008 \$ 126,875,545 35.1%

\* Other miscellaneous capital vendors includes various contractors used in the renovation and construction for both the central Command Center and the Southwest Command Center as well as computer hardware purchases outside of the scope of the Motorola contract.

Schedule of Sources and Uses - STARS Operations  
 From July 1, 2000 through December 21, 2008

	Project Total	2009	2008
Operating Sources:			
State Police Operating Appropriation	\$ 9,524,714	\$ -	\$ -
General Fund STARS Appropriation	<u>15,917,958</u>	<u>2,510,000</u>	<u>2,510,000</u>
 Total sources	 <u>25,442,672</u>	 <u>2,510,000</u>	 <u>2,510,000</u>
Capital Uses:			
Hayes, Seay, Matter, & Mattern	11,380,824	87,593	896,639
State Police payroll and internal services	4,932,986	435,211	823,567
Motorola services	797,648	-	15,828
Other Miscellaneous Vendors*	<u>3,156,460</u>	<u>325,567</u>	<u>519,406</u>
 Total uses	 <u>20,267,919</u>	 <u>848,371</u>	 <u>2,255,440</u>
 Net of sources over uses	 <u>\$ 5,174,753</u>	 <u>\$ 1,661,629</u>	 <u>\$ 254,560</u>

\* Other miscellaneous operating vendors includes travel reimbursements for inspection and project management teams as well as miscellaneous supplies and services to support the operation of the Project Management Team.

\*\*Costs were incurred in relation to this project prior to fiscal year 2004 and prior to the execution of the contract with Motorola. Although those costs are not reflected in annual columns, they are included in the Total Project Cost column. All project related expenses prior to 2004 were funded by State Police's operating appropriations.

APPENDIX B

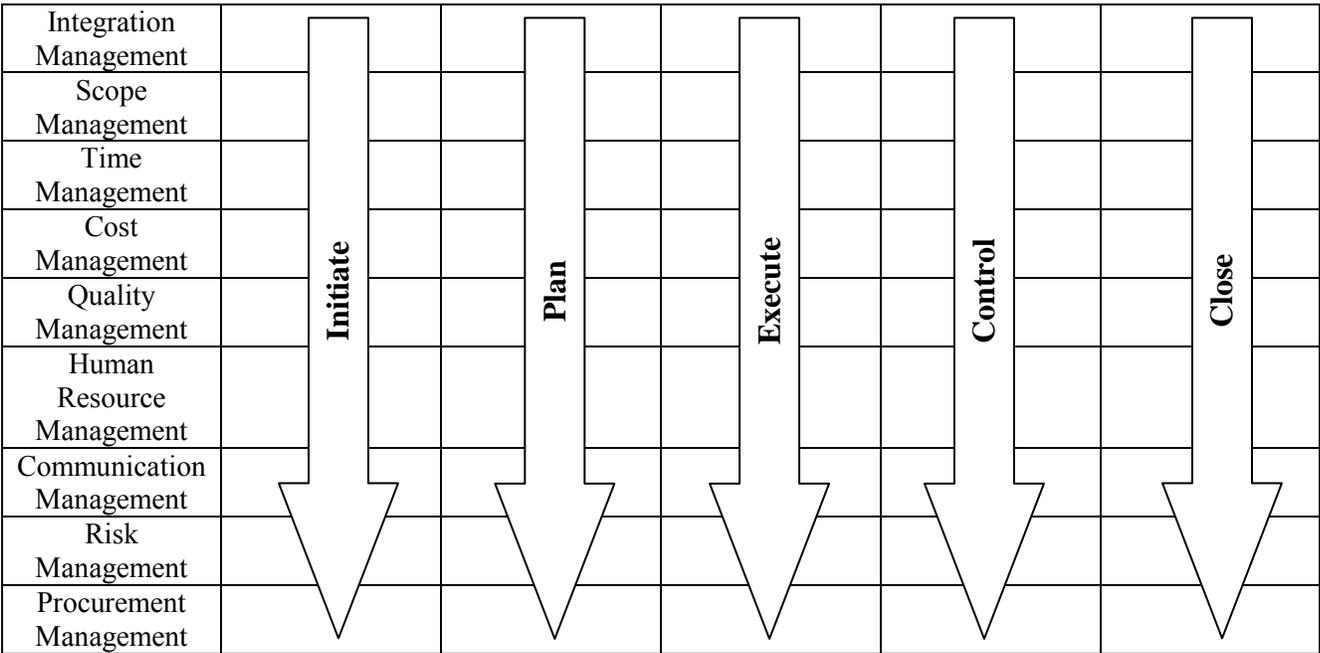
2007	2006	2005	2004**
\$ -	\$ 1,417,139	\$ -	\$ -
<u>2,510,000</u>	<u>2,754,359</u>	<u>2,633,599</u>	<u>3,000,000</u>
<u>2,510,000</u>	<u>4,171,498</u>	<u>2,633,599</u>	<u>3,000,000</u>
956,120	1,155,139	705,100	512,762
841,564	1,068,681	718,714	483,634
-	781,820	-	-
<u>348,867</u>	<u>1,165,857</u>	<u>175,481</u>	<u>142,792</u>
<u>2,146,551</u>	<u>4,171,498</u>	<u>1,599,295</u>	<u>1,139,188</u>
<u>\$ 363,449</u>	<u>\$ -</u>	<u>\$ 1,034,304</u>	<u>\$ 1,860,812</u>

Best Practices in Project Management

The Project Management Institute (PMI) publishes the Project Management Body of Knowledge Guide (PMBOK), which is an internationally recognized standard that provides the fundamentals of project management as they apply to a wide range of projects. The Project Management Division of VITA has also adopted PMBOK practices in its Information Technology Resource Management (COV ITRM CPM 110) Project Management Guideline.

The PMBOK’s organization uses five process groups and nine knowledge areas which intersect one-another. The process groups include initiating, planning, executing, controlling, and closing the project. Through each of these processes, project managers should consider best practices in integration, scope, time, cost, quality, human resource, communication, risk, and procurement management. Figure 1 below is a visual representation of how the knowledge areas and process groups intersect.

Figure 1: PMBOK Knowledge Areas and Process Groups

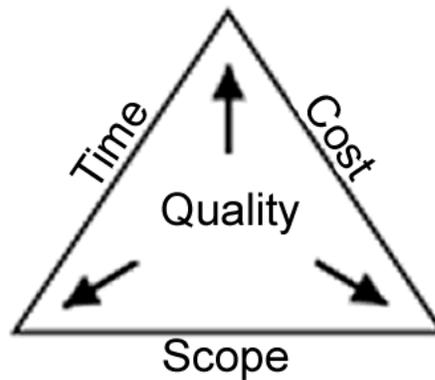


The key to this principle is that all aspects of project management are ongoing throughout the life of the project and that a Project Management Plan, once created, is a dynamic document, not static. Project managers are guided by PMBOK to focus on the nine knowledge areas described above throughout each stage of the project.

Triple Constraint

The Triple Constraint of Project Management includes the balanced management of project scope, project time, and project cost. All three of these constraints have a direct impact on the quality of the deliverable. The Project Management Triangle (Figure 2) is a visual depiction of this concept where each side represents a constraint. One side of the triangle may not change without impacting the others.

Figure 2: The Project Management Triangle (Triple Constraint)



The time constraint refers to the amount of time available to complete the project. The cost constraint refers to the budgeted amount of funds available for the project. The scope constraint refers to what the project must complete in order to produce the final deliverable. These constraints are often competing constraints. For example, increased scope will typically create a need for increased time and increased cost. If the time constraint is tightened, costs could increase while the scope is reduced.

## Best Practices as established in the Project Management Body of Knowledge (PMBOK)

<b>PMBOK</b>	<b>Best Practice</b>	<b>Yes</b>	<b>Partially</b>	<b>No</b>
1.6.4	Is there an organizational unit which centralizes and coordinates the project management function and processes?	✓		
2.1	Is there recognized project life cycle phasing, complete with deliverables, phase-end acceptance, and formal authorization to start the next phase?	✓		
2.2	Does the project manager and the project management team try, early in the project, to identify a wide range of stakeholders and their requirements, including negative stakeholders ("those who see negative outcomes from the project's success")?	✓		
2.2	Is there clearly one person responsible for managing the project?	✓		
2.2 & 9	Is there a clearly identified project sponsor - "a person or group that provides the financial resources for the project"?	✓		
4.1	Is there a document (project charter) which authorizes the start of a project, and authorizes the project manager to expend resources on the project?	✓		
4.1a	Does the charter include a purpose or justification?	✓		
4.1b	Does the charter include the business needs?	✓		
4.1c	Does the charter include a summary schedule and budget?	✓		
4.1d	Does the charter include the expectations of stakeholders?	✓		
4.1e	Does the charter include project assumptions and constraints (time-money-scope)?	✓		
4.3	Does the organization have a documented Project Management Plan, describing how the project will be executed, monitored, and controlled?	✓		
4.6a	Is there a system in place to handle, document, and approve proposed or required changes to the cost, schedule, or scope?	✓		
4.6b	Is there a process in place to communicate changes to the project cost, schedule, or scope?	✓		
4.7.3	Are lessons learned from the project formally recorded and distributed for future benefit?		✓	
4.7.3	Are scope changes, actual costs, and actual schedule recorded?	✓		
5.2	Does project planning produce documents (e.g. scope statement) including:			
	project objectives?	✓		
	product description?	✓		
	what is in and out of scope?	✓		
	acceptance criteria?	✓		
	constraints and assumptions?	✓		
	organization structure?	✓		
	schedule milestones?	✓		
	approval requirements?	✓		
	cost estimate?	✓		
5.3	Is a work breakdown structure created providing the structure for the budget and schedule?	✓		

<b>PMBOK</b>	<b>Best Practice</b>	<b>Yes</b>	<b>Partially</b>	<b>No</b>
5.4	Is there a process to obtain stakeholders' formal acceptance of the completed project scope?	✓		
6.5a	Are schedules produced for substantially all work on the project, and distributed to team members?	✓		
6.5b	Are "critical" tasks identified in the project schedule?	✓		
6.5c	Does scheduling consider the internal people resources required, and is the schedule reconciled against resources available?		✓	
6.6	Are the schedules updated regularly to show actual and forecast, and published with a comparison to schedule baseline?		✓	
6.7	Is appropriate corrective action taken if the project is falling behind schedule?		✓	
7	Is a cost estimate produced for substantially all work on the project?	✓		
7.3a	Is the cost estimate (budget) updated regularly to show actual costs to date?		✓	
7.3b	Is the cost estimate (budget) updated regularly to show estimates to complete?		✓	
7.3c	Is the cost estimate (budget) published with a comparison to the approved budget?	✓		
7.3d	Is the "earned value" technique used?			A
7.3e	Is corrective action taken at the appropriate time if the project is trending over budget?	✓		
7	Do project decisions include consideration of the cost of using or owning the product (Life-cycle costing or total cost of ownership)?		✓	
8.1	Does the organization use project management process improvement tools:			
	benchmarking?			B
	independent audits/reviews?	✓		
	other quality planning tools?			B
8.2	Does the organization take action on non-conformance within the project to discover the "root-cause" and initiate preventative and corrective action?		✓	
9	Do cross-functional team members join the project early and participate in project planning and decision making?		✓	
9.1.2.1	Do all team members have a clear understanding of their roles and responsibilities?	✓		
9.1.3.1	Does team member authority reasonably match responsibility?	✓		
9.1.3.1	Does assignment of team members take into account their competencies, cost, and responsibilities?	✓		
9.3.1	Once project execution is started, is each team member's duration on the project planned and therefore reasonably predictable?		✓	
9.4	Does the core project management team reasonably observe team behavior, manage conflict, and resolve issues?	✓		
9.4	Does the project manager or team reasonably evaluate team and team member performance and provide feedback for improvement?		✓	
10.1	In project planning has the team determined the information and communication needs of the stakeholders as follows:			
	Who are the stakeholders?	✓		
	Who needs what information?	✓		

<b>PMBOK</b>	<b>Best Practice</b>	<b>Yes</b>	<b>Partially</b>	<b>No</b>
	When is the information needed?	✓		
	How will it be provided?	✓		
	Who will provide the information?	✓		
10	Do stakeholders (including team members) feel that communications processes are reasonably sufficient?	✓		
10.3	Is there regular status reporting (work achieved versus work scheduled, percentages complete, future forecast progress, issues and problems, recommended corrective action) to appropriate stakeholders?	✓		
10.4.3	Are issues logs used to document concerns and their resolutions?	✓		
11.1.3.1	Does the project team have a defined methodology for risk management?	✓		
	Does the risk management methodology include roles and responsibilities?	✓		
	Does the risk management methodology include a means for categorizing and prioritizing risks?	✓		
11.2	Does the team identify and document risk events (e.g. brainstorming sessions, interviewing subject matter experts)?	✓		
11.2.3	Is a document maintained logging all identified risks, their priorities or categories, and an "owner" for each risk?	✓		
11.3	Are the probability and impact of each risk estimated?	✓		
11.5	After identifying risks does the team develop and document appropriate responses?	✓		
11.5.2	In planning, does the team identify and document "opportunities" (uncertainties with potential positive effects on the project)?			C
11.6	During project execution, does the team monitor identified risks and ensure or revise risk responses with the risk owner or appropriate stakeholder?	✓		
11.6	During project execution, does the team continue to identify, document, analyze, and respond to new risks?		✓	
11.6.2.5	Does the project use contingency reserves in the budget and schedule?			D
11.6.2.5	Does the project consciously manage contingencies during the execution of the project?			D

Notes:

- A. The project management team made a conscious decision not to apply the Earned Value Technique on this project. Although this technique is a best practice, management considers its use inappropriate on this particular project.
- B. The project management team decided to use external audits and quality control as the only external process improvement tools.
- C. The project team does not identify “opportunities” or “lessons learned” for this project as they will have limited future use for any documented “opportunities” on future projects.
- D. The project management team requested a budgetary contingency for the project during inception, however the request was not granted by the appropriate project sponsors and therefore no contingency is used.