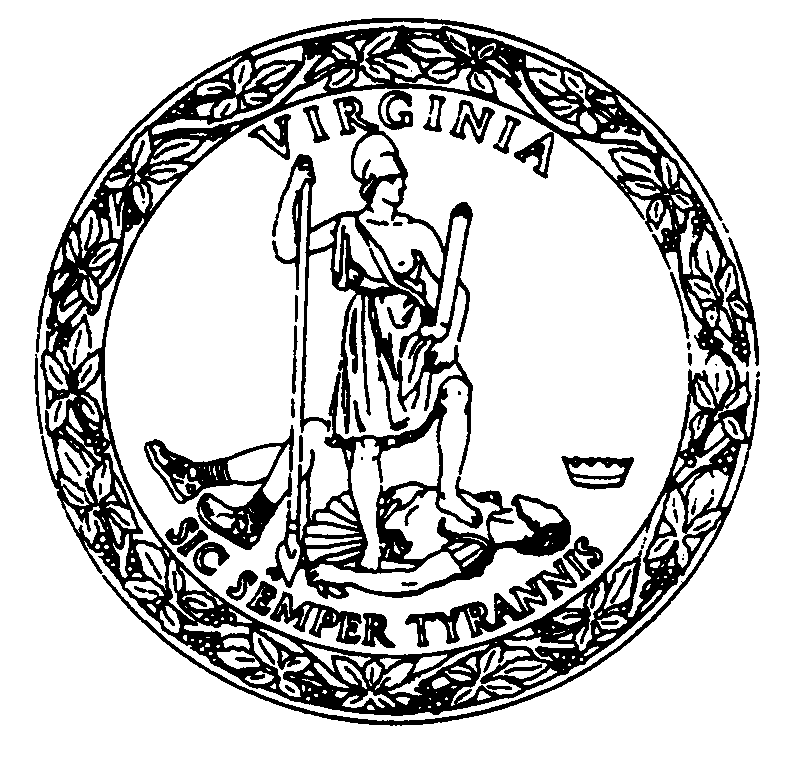
**Attachment 3: Report Template for IV&V Reviews**

The attached template is used by service providers to report on Independent Verification and Validation Reviews for major IT projects. This template will be included as Attachment 3 in all SOWs sent to providers or potential providers.

***Please note that the attached sample has fictitious information that must be updated with pertinent project data***

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**Commonwealth of Virginia**



**Report on the**

***(Enter Type of IV&V Review)* Independent Verification and Validation (IV&V) Review**

SAMPLE

**Of**

***(Enter name of major it project)***

**(Enter Date of Report)**

***(Enter Name of Agency)***

**Table of Contents**

**Executive Summary**

The Commonwealth of Virginia Information Technology (IT) Resource Management Policy for Technology Management requires the implementation of an Independent Verification and Validation (IV&V) Strategy for all Major IT Projects. At the direction of the Chief Information Officer (CIO), the VITA Project Management Division (PMD) was directed to include specific guidance and requirements for the IV&V of Major IT Projects in COV ITRM Standard GOV 102-02, *Project Management*, dated November 22, 2021 and to develop and implement an IV&V Review Program for Major IT Projects in support of the Project Management Standard. An essential component of the IV&V Review Program is the presentation of IV&V Review Reports of all Major IT Projects. This is the *(Enter Type of IV&V Review)* Report of the *(Enter Major IT Project Name)* Project IV&V Review.

**Background Information**

**Project Title:** *(Enter the Major IT Project Name)*

**Agency:** *(Enter the Sponsoring Agency’s Name)*

**IV&V Service Provider:** *(Enter the IV&V Service Provider Company Name)*

**Date of IV&V:** *(Enter the dates of the IV&V Review)*

**Planned Start Date:** *(Enter the date the Major IT Project was planned to begin)*

**Planned (Baseline) Completion Date:** *(Enter the date the Major IT Project was originally planned to end, as reflected on the Commonwealth Major IT Project Status Report Dashboard)*

**Estimated Completion Date:** *(Enter the date the Major IT Project is currently expected to end, as provided by current Project Management)*

**Estimated (Baseline) Total Project Cost:** *(Enter the original estimated cost of the Major IT Project, as provided by current Project Management)*

**Actual Cost-to-Date:** *(Enter the actual cost-to-date of the Major IT Project, as provided by current Project Management)*

**Project Summary**

The objectives and scope of the *(Enter the Major IT Project Name)* Project, currently in the *(Enter the current phase (e.g., initiation, planning, execution and control, closeout) of the Major IT Project)* phase, are to *(Provide a short narrative description of the objectives and scope statements from the Baseline Information section of the Project Background section of the “Commonwealth Major IT Project Status Report Dashboard” entry for the Major IT Project. Include in the narrative the major motivating factors behind the Major IT Project, as well as, the major benefits that are to be realized through the completion of the Major IT Project. An example of such a Project Summary narrative is provided below. )*

*(“The objective and scope of the WebDMS Project, currently in the late stages of the Execution and Control phase, is to create a new web-based document management application that will replace an existing and antiquated DEC-based Document Management System (DMS). Maintaining the existing DEC machines is becoming increasingly difficult and expensive. As a result, the agency has decided to replace the existing DMS with more up-to-date and flexible technology, that is, a Web and Oracle-based system employing a Graphical User Interface to the users of the system. The new system will be known as WebDMS (Web-based Document Management System). The WebDMS system will have, as a minimum, the same functionality as the current DMS system. The DMS system is an automated document management system that links all of the VABC locations statewide.”)*

**Summary of Findings**

Findings can be positive or negative. Positive findings can be further designated a “Best Practice”, i.e. noteworthy actions or processes that should be shared with all Commonwealth IT projects. Negative findings are categorized as Major or Minor findings. Major findings are findings of the absence of a technological, management or financial process or breakdown of a process that may result in the failure of the project or seriously impact its schedule, fiscal status or public image. Minor findings are single observed lapses or isolated incidents where technological, management, or financial processes are not following the approved processes. A Minor finding has minimal risk of causing a serious impact to a project schedule, fiscal status or public image.

*(Provide a short narrative summary of the findings from the IV&V Review. Provide positive and negative findings in separate paragraphs. Major findings should be addressed first in the negative findings summary. Not all Minor findings need to be summarized. If the IV&V Review is one in a series of previous IV&V Reviews, include in the narrative a comparison of the findings of the current IV&V Review with those of the previous IV&V Reviews. An example of such a Summary of Findings narrative is provided below. )*

*(“The WebDMS Project has encountered a number of challenges over the past three years that have caused the scheduled implementation of the new system to slip significantly. Despite the project’s shortcomings in planning and process, the project is in the final stages of implementation. The project will go into production in early 2004. Additionally, the user community is excited and anxious to make use of the new technology contained in the new system. The WebDMS Project is also likely to come in under budget.*

*Many of the Minor findings from this third In-Progress IV&V Review continue to highlight opportunities for VABC Major IT Project management process improvement that may not be addressable in the WebDMS Project, given it is in the later stages of the execution and control phase of the project, but do provide good lessons learned for future VABC Major IT Projects. Correspondingly, the recommendations associated with these findings have been categorized into short- and long-term recommendations. The short-term recommendations will help ensure that the WebDMS project concludes successfully, and the long-term recommendations are aimed at improving the performance and effectiveness of future VABC Major IT Projects.*

*Many of the challenges faced by the WebDMS Project Team over the course of the two-year lifecycle of the project can be attributed to two main issues:*

* + *Not establishing a Project Steering Committee, and*
  + *Not spending sufficient time defining requirements and planning the project.*

*First, the lack of a Project Steering Committee has resulted in limited governance and oversight of the project’s progress, no defined issue escalation processes or procedures, no change control processes or procedures, and no formal communications between the WebDMS Project Management Team and the agency stakeholders. Regular project status reporting was occurring between WebDMS Project Management and VABC IT Management, however, information was not always being communicated to the agency stakeholders. Second, not spending sufficient time to fully understand and define the system requirements resulted in the WebDMS Project Team initially underestimating the complexity of the project and consequently underestimate the resources needed to complete the project, as well as, the amount of time needed to develop, implement, and test the new system.*

*A WebDMS Project Plan was initially developed to manage the WebDMS Project. However, since November 2002 the WebDMS Project Plan has not been followed nor updated. Over the past year, an informal project calendar methodology has been used by the WebDMS Project Team to manage the project. This informal management of project activities makes it difficult to communicate project status, track progress, and plan and communicate activities among members of the WebDMS Project Team and between the Project Team and VABC IT Management. Additionally, there is no comprehensive set of metrics (e.g. schedule variance, number of high importance defects/bugs identified, number of users trained versus target, etc.) being tracked so that an objective view of the project’s overall status can be portrayed.*

*Apart from User Acceptance Testing (UAT), there are no formal, independent quality assurance processes in place for the WebDMS Project. Developers are individually responsible for providing technical oversight, which immediately leads to a conflict of interest and leaves all independent testing to the users. IT Quality Assurance is undermined by not having a Software Quality Assurance (SQA) function to review the work of the WebDMS Project Team (e.g. develop and execute system and integration test scripts, review project documentation and code, assess project management practices, etc.). The lack of a SQA function within the WebDMS Project may be an indicator of a more systemic deficiency within VABC IT management and could impact other VABC IT projects as well.*

*Although, some effort has gone into operations support planning, no formal Operations Support Plan has been developed. Given that the VABC IT organization does not have an application support group, the WebDMS Project Team will be required to continue to support the WebDMS application after it goes into production, which could lead to conflicts over work priorities (e.g. new project work versus WebDMS support). The need for project team members to provide ongoing operational support of an system once it is fielded may be an indicator of a more systemic deficiency within VABC IT management and could impact other VABC IT projects and VABC IT resources.”)*

**Summary of Analysis**

*(Provide a short narrative summary of the analysis performed on the findings from the IV&V Review. If the IV&V Review is one in a series of previous IV&V Reviews, include in the narrative a comparison of the analysis of the findings of the current IV&V Review with the analyses of findings for the previous IV&V Reviews. An example of such a Summary of Analysis narrative is provided below. )*

*(“The WebDMS project has missed its original schedule, changed scope, and failed to fully account for cost. The project is in the final stages of the Execution and Control Phase and current indications are that the project will closeout in April 2004. The Commonwealth Major IT Project Status Report Dashboard clearly identifies that the WebDMS Project is Yellow for schedule and scope. The WebDMS Project has been in an overall Yellow status since January 2003. The WebDMS Project Plan also lacks a Risk Management Plan and a Quality Management Plan.*

*The WebDMS Project Team should implement a few positive and cost effective measures. Suspension of the project would gain little at this stage of the WebDMS Project lifecycle. The WebDMS Project Team needs to establish a revised Project Schedule and VABC IT Management needs to exercise intensive oversight of the WebDMS Project during the final implementation phase. The Third In-Progress IV&V Review identified a number of immediate actions that should be implemented by the WebDMS Project Team. The response of VABC IT Management indicates that they have begun addressing the revision of the Project Schedule and are reviewing measures that they can take to address the remaining IV&V Review recommendations.”)*

**Summary of Recommendations**

*(Provide a bulleted list of the primary recommendations resulting from the IV&V Review. An example of such a Summary of Recommendations is provided below. )*

* *VABC (WebDMS Project Team) develop a detailed project schedule, covering both business and technical responsibilities, for the final months of the project and update the Commonwealth Major IT Project Status Report Dashboard.*
* *VABC (WebDMS Project Team) identify business and technical risks that may affect the WebDMS Project over the final months of the execution and control phase and update the current risk status on the Commonwealth Major IT Project Status Report Dashboard.*
* *VABC (WebDMS Project Team) document scope changes to the WebDMS Project.*
* *VABC (WebDMS Project Team) develop a Transition Plan to move WebDMS from its current project status into operational support by January 31, 2004.”)*

**Summary of Best Practices**

*(Provide a short summary of the processes, practices, or systems identified during the review that performed exceptionally well. These processes, practices, or systems can be used in other organizations.)*

**Summary of Lessons Learned**

*(Provide a bulleted list of the primary lessons learned gathered from the IV&V Review. An example of such a Summary of Lessons Learned is provided below. These lessons come from working with or solving real-world problems. Lessons learned identify problems and solutions to problems. Collecting and disseminating lessons learned helps to eliminate the occurrence of the same problems in future projects. Lessons learned are negative with respect to identifying process, practice, or systems to avoid in specific situations, or can be positive with respect to identification of solutions to problems when they occur).*

One of the nine Demonstration sites purchased third party equipment w/ delivery occurring 1 week prior to phase. The lessons learned are:

* + Hardware and/or BIOS specifications identified and published.

1) Allocate realistic time to test equipment.  
  
2) Hold vendor responsible and accountable for error.

**Introduction**

The Commonwealth of Virginia Information Technology (IT) Resource Management Policy for Technology Management requires the implementation of an Independent Verification and Validation (IV&V) Strategy for all Major IT Projects. At the direction of the Chief Information Officer (CIO), the VITA Project Management Division (PMD) was directed to include specific guidance and requirements for the IV&V of Major IT Projects in COV ITRM Standard GOV 102-02, *Project Management*, dated November 22, 2021, and to develop and implement an IV&V Review Program for Major IT Projects in support of the standard. An essential component of the IV&V Review Program is the conduct of IV&V Review Reports of all Major IT Projects. This *(Enter Type of IV&V Review)* of the *(Enter Major IT Project Name)* Project is such an IV&V Review Report. In accordance with the *(Enter Major IT Project Name)* IV&V Plan, this is the *(Enter numerical sequence number)* IV&V Review in a series of *(Enter the total number of IV&V Reviews for the Major IT Project)* IV&V Reviews that will be conducted for the *(Enter Major IT Project Name)*Project. The IV&V Schedule for the *(Enter Major IT Project Name)* Project is shown below: *(Insert the first two columns (i.e., Activity and Scheduled Date or Phase) of the Independent Verification and Validation Schedule contained in Section 2 of the IV&V Plan. An example of such an IV&V Plan extract is provided below.)*

|  |  |
| --- | --- |
| ***Activity*** | ***Scheduled Date or Phase*** |
| Develop IV&V Plan | 11-March-05 |
| Detailed Project Plan IV&V Review | 21-March-05 |
| User Acceptance Test Planning IV&V Review | 29-March-05 |
| First In-progress IV&V Review | 15-April-05 |
| Deployment Plan IV&V Review | 27-July-05 |
| User Acceptance Test Report IV&V Review | 8-August-05 |
| Second In-progress IV&V Review | 19-August-05 |
| Deployment Report IV&V Review | 12-September-05 |
| Final Acceptance Report IV&V Review | 20-October-05 |
| Third In-progress IV&V Review | 28-October-05 |
| ~~Closeout IV&V Review~~ | ~~31-January-06~~ |

**Background**

The *(Enter Type of IV&V Review)* IV&V Review for the *(Enter Major IT Project Name)* was conducted on *(Enter the dates of the IV&V Review)* at the *(Enter the Sponsoring Agency’s**Name)* offices at *(Enter the address of the location where the work was performed).* The IV&V Review Team consisted of:

*(Enter IV&V Review Team Member’s Name)* *(Enter Company Name)*

*(Enter IV&V Review Team Member’s Name)* *(Enter Company Name)*

*(Enter IV&V Review Team Member’s Name)* *(Enter Company Name)*

Key personnel from the *(Enter Major IT Project Name)* Project Management Team and the *(Enter Sponsoring Agency’s Name)* participated in the *(Enter Type of IV&V Review)* IV&V Review of the *(Enter Major IT Project Name)*. These agency personnel participating in the IV&V Review were as follows:

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

*(Enter Name of Agency Representative)* *(Enter Agency Representative’s Title)*

**Methodology**

The *(Enter Type of IV&V Review)* IV&V Review of the *(Enter Major IT Project Name)* Project was conducted in accordance with the *(Enter Type of IV&V Review)* Project IV&V Plan. The IV&V Task Items were accomplished through a combination of interviews and documentation reviews. A list of the personnel contacted is provided in Attachment 1 and a list of the documents reviewed is provided in Attachment 2. The accomplishment of the IV&V Task Items resulted in the generation of detailed Findings for each IV&V Task Items and, where necessary, the development of Recommendations for corrective and/or improvement actions. The Detailed Findings and Recommendations of the *(Enter Type of IV&V Review)* IV&V Review of the *(Enter Major IT Project Name)* Project are provided in Attachment 3. Attachment 4 provides a list of Best practices observed during Review(s). Attachment 5 provides a detailed list of Lessons Learned to date for this project. Finally, the IT Project Complexity Model presented as Appendix A of COV ITRM Standard GOV 102-02, *Project Management*, dated November 22, 2021 was updated/re-accomplished for the *(Enter Major IT Project Name)* Project. The updated/re-accomplished model is provided in Attachment 6.

**Appendix 1: List of Personnel Contacted**

The List of Personnel Contacted identifies the individuals who provided informational inputs to the (*Enter Major IT Project Name)* Project *(Enter Type of IV&V Review)* IV&V Review.

|  |  |  |  |
| --- | --- | --- | --- |
| **Number** | **Name** | **Title/Position** | **Organization** |
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**Appendix 2: List of Documents Reviewed**

The List of Documents Reviewed identifies the documents that were reviewed as part of the *(Enter Major IT Project Name)* Project *(Enter Type of IV&V Review)* IV&V Review.

|  |  |
| --- | --- |
| **Number** | **Document/Data Title/Description** |
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**Appendix 3: Detailed Findings and Recommendations Table**

The Detailed findings and Recommendations Table provides the detailed findings and recommendations developed during the *(Enter Major IT Project Name)* Project *(Enter Type of IV&V Review)* IV&V Review for each of the IV&V Review Areas and Tasks specified in the agency Statement of Work. (Specified in Attachment 1 and 2 of the SOW). “Not reviewed per SOW,” is entered in the findings column for task not specified in the SOW. (*Selected examples of findings and recommendations narratives are provided below.)*

| **Review Area** | **Task Item** | **Task Description** | **Findings** | **Recommendations** |
| --- | --- | --- | --- | --- |
| **Feasibility Studies** | **FS-1** | Assess the methodologies used for the technical and economic feasibility study verifying it was objective, reasonable, measurable, repeatable, consistent, accurate and verifiable. | Not Reviewed per SOW |  |
| **FS-2** | Review the system requirements (e.g., system requirements specification, feasibility study report, business rules description) in the RFP, Vendor Proposal, and Contract SOW to validate whether the requirements can be satisfied by the defined technologies, methods, and algorithms defined for the project (feasibility). | Not Reviewed per SOW |  |
| **Business Case** | **BC-1** | Review and evaluate the Business Case for the project to assess its reasonableness. |  |  |
| **Procurement Methodology** | **PROC-1** | Verify that the procurement strategy supports Agency and Commonwealth project objectives. |  |  |
| **PROC-2** | Review and make recommendations on the solicitation documents relative to their ability to adequately inform potential vendors about project objectives, requirements, risks, etc. |  |  |
| **PROC-3** | Verify that the evaluation criteria are consistent with project objectives and evaluation processes are consistently applied; verify all evaluation criteria are metrics based and clearly articulated within the solicitation documents. |  |  |
| **PROC-4** | Verify that the obligations of the vendor, sub-contractors and external staff (terms, conditions, statement of work, requirements, technical standards, performance standards, development milestones, acceptance criteria, delivery dates, etc.) are clearly defined. This includes verifying that performance metrics have been included that will allow tracking of project performance and progress against criteria set by the agency and the Commonwealth. |  |  |
| **PROC-5** | Verify the final contract for the vendor team states that the vendor will participate in the IV&V process, being cooperative in the coordination and communication of information. |  |  |
| **Proc-6** | If Security Exceptions were identified during ECOS that led to additional requirements being inserted in the Cloud Terms Suppler responsibilities section, ensure that a process exists to incorporate these changes into the contract |  |  |
| **PROC-7** | Verify that the assigned project complexity level is current and accurate. If the project complexity level is not current and/or accurate, then recommend a project complexity level to the project.If Security Exceptions were identified during ECOS that led to additional requirements being inserted in the Cloud Terms Suppler responsibilities section, ensure that a process exists to incorporate these changes into the contract. |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Project Sponsorship** | | **PS-1** | | Assess agency sponsor buy-in, participation, support and commitment to the project. | Positive Finding: Bill Williams and Debbie Black are the project sponsors and understand their roles well (e.g., provide visible leadership and resources, remove barriers, etc.). The sponsors are co-located on the same floor as the project team that aids communication and fosters executive involvement.  Positive Finding: Bill is the project champion and owner. He is very involved in the decision-making process and very bought-in to the need for the database conversion. Bill has “faith in his team and confidence in their ability to execute.”  Positive Finding: Debbie, as the technical sponsor, has been deeply involved in all aspects of the project.   * + - * + She attends weekly status meetings.         + She is very supportive of the project team.         + She delivers “hard messages” to the staff as required (when additional effort needs to be exerted).   Positive Finding: The project team appears to be a high performing work team – working hard and enjoying the challenges presented schedule and on budget. | | The project management team should continue strong and active sponsor support and engagement as has been demonstrated throughout this project. |
| Bill and Debbie have mandated that this project maintain a low technical risk profile. | |  |
| **PS-2** | | Verify that open pathways of communication exist among all project stakeholders. |  | |  |
| **PS-3** | | Verify that agency sponsor and IAOC have bought-in to all changes that impact project scope, cost, schedule or performance. |  | |  |
| **Project Management** | | **PM-1** | | Verify that a project management plan exists and that the plan is being followed. | Positive Finding: A detailed project plan exists and the plan is being closely followed. Given that the project team is using the contractor’s implementation methodology, the project plan is defined and documented in the contractors re-engineering plan.  Positive Finding: Microsoft Project is being used to track all aspects of the project plan including tasks, resources, and costs so that variations can be identified and managed closely.  Positive Finding: Jerry Riggs is very skilled with Microsoft Project and uses it to generate most of the project’s reporting. | | The project team should continue the execution and maintenance of the existing project management plan. |
| **PM-2** | | Evaluate the project management plan maintenance procedures to verify that they are developed, communicated, implemented, monitored and complete. |  | |  |
| **PM-3** | | Evaluate project reporting processes and procedures and actual project reports to verify that project status is being accurately traced using project metrics. |  | |  |
| **PM-4** | | Verify that milestones, Measures of Success, and completion dates are approved by Project Sponsor and the IAOC and are planned, monitored, reported, and met. |  | |  |
| **PM-5** | | Evaluate the status of the schedule being reported for the project on the Commonwealth IT Project Schedule. |  | |  |
| **PM-6** | | Evaluate the system’s planned life-cycle development methodology or methodologies (waterfall, evolutionary spiral, rapid prototyping, incremental, etc.) to see if they are appropriate for the system being developed. |  | |  |
| **PM-7** | | Verify that the Measures of Success for the project incorporate input from the system’s users and customers. |  | |  |
| **PM-8** | | Determine if the project has remained within its approved scope. |  | |  |
| **PM-9** | | For each change in the approved scope of the project verify the date the change was approved and by whom. |  | |  |
| **PM-10** | | For each change in the approved scope of the project, evaluate the description of the change, the reason for the change, and the impact of the change, particularly on the cost and schedule baselines of the project. |  | |  |
| **Business Process Reengineering** | | **BPR-1** | | Evaluate the project’s ability and plans to redesign business processes to achieve improvements in critical measures of business performance, such as cost, quality, service, and speed. |  | |  |
| **BPR-2** | | Verify that the reengineering plan has the strategy, management backing, resources, skills and incentives necessary for effective change. |  | |  |
| **BPR-3** | | Verify that resistance to change is anticipated and prepared for by using principles of change management at each step (such as excellent communication, participation, incentives) and having the appropriate leadership (executive pressure, vision, and actions) throughout the reengineering process. |  | |  |
| **Risk/IssuesManagement** | | **RM-1** | | Verify that risk and issues management processes and procedures exist and adhered to. Evaluate the project’s risk and issues management processes and procedures to verify that risks are identified and quantified, and that risk and issue mitigation strategies are developed, communicated, implemented, monitored, and tracked to closure. | Minor Finding: A high-level risk management plan is included in the contractor’s reengineering plan. The reengineering plan is a comprehensive document but does not go into the same level of detail that is outlined in the VITA templates.  Minor Finding: Risks have not been differentiated from issues to-date. As a result, risk management has been handled tactically on this project and focused more on the technical aspects. Strong communications across a small and high performing project team has made this work up to this point; however, this approach is susceptible to breakdowns and lends itself more to reactionary risk management.  Positive Finding: Overall, the project has a relatively low technical risk profile:   * + - * + The contractor has done this type of work a number of times with other customers.         + There are no new or additional business requirements. This project should be transparent to the end users. | | The project team should develop a formal and detailed Risk Management Plan to enable more active management of risks and risk mitigation plans including costs.  The project team should conduct a monthly QA review session to review all closed and outstanding issues, risks and associated action plans/mitigation plans with the project sponsor (i.e., Connie White) to ensure that issues and risks are closely managed and communicated in the late stages of this project. |
| **RM-2** | | Verify that a list of risk events is maintained and that the probability of occurrence and impact are measured for each event. If risk events are removed determine reason why. |  | |  |
| **RM-3** | | Verify that the top five risk events identified for the project are those being reported for the project on the Commonwealth IT Project Status Report. |  | |  |
| **RM-4** | | Verify that the Internal Agency Oversight Committee (IAOC) has reviewed the project Risk Assessment(s), including the date(s) when the Risk Assessment(s) were reviewed by the IAOC. |  | |  |
| **Change Management** | | **CHM-1** | | Verify that change management processes and procedures exist and are being followed. Evaluate the project’s change management processes and procedures to verify they are developed, communicated, implemented, monitored, and complete. | Minor Finding: No Change Management Plan has been completed; however, given the limited scope of the project (one agency, one department and no impact on end-users), a formal Change Management Plan may be of limited benefit. A Communications Plan has been defined and is being executed to ensure all stakeholders are properly and adequately informed. | | DDD should include people-focused change management plans in all future system development activities that impact end users. Future initiatives that are founded on this new platform will likely impact end-users dramatically. |
| **CHM-2** | | Evaluate the project’s organizational change management processes and procedures to verify that organizational resistance to change is anticipated and prepared for. |  | |  |
| **CHM-3** | | In the case of a vendor supported solution, verify documented processes exist to communicate and implement the change with agency authorization and testing. |  | |  |
| **Communication Management** | | **COM-1** | | Verify that communication processes and procedures exist and are being followed. Evaluate the project’s communication processes and procedures to verify they support communications and work product sharing between all project stakeholders; and assess if communication plans and strategies are effective, implemented, monitored and complete. |  | |  |
| **Configuration Management** | | **CM-1** | | Review and evaluate the configuration management (CM) processes and procedures associated with the development process. Verify that configuration management (CM) processes and procedures exist and are being followed. Evaluate the project’s configuration control processes and procedures to verify that they are effective, implemented, monitored and complete. |  | |  |
| **CM-2** | | Verify that all critical development documents, including but not limited to requirements, design, code and test are maintained under an appropriate level of control. | Minor Finding: Unlike code configuration management, there is no defined project documentation control process, which could lead to document revision issues (i.e., which version is current or most updated). The DSS and Sogeti project managers own all project planning documentation to maintain version control and updates. Documents are maintained on a shared drive under a structured set of project directories with secured access.  All project planning documentation is also maintained under a version control tool (PVCS) and is manually updated monthly to facilitate project archiving. The project team due to training issues is not using PVCS.  User acceptance scripts are maintained on the server (Word and Excel based). | | DDD should work with VITA to specify and procure a mainframe-based software configuration management tool that integrates with the software development environment. This tool should be used as the application moves into production and for future maintenance/development.  A formal document control process should be evaluated and implemented for all project-related documentation. PVCS or SharePoint should be considered as potential tools. |
| **CM-3** | | Verify that the processes and tools are in place to identify code versions and to rebuild system configurations from source code. |  | |  |
| **CM-4** | | Verify that appropriate source and object libraries are maintained for training, test, and production and that formal sign-off procedures are in place for approving deliverables. |  | |  |
| **CM-5** | | Verify that appropriate processes and tools are in place to manage system changes, including formal logging of change requests and the review, prioritization and timely scheduling of maintenance actions. |  | |  |
| **CM-6** | | Verify that mechanisms are in place to prevent unauthorized changes being made to the system and to prevent authorized changes from being made to the wrong version. |  | |  |
| **CM-7** | | Review the use of CM information (such as the number and type of corrective maintenance actions over time) in project management. |  | |  |
| **Work and Assignments (Project Estimating**  **and**  **Scheduling)** | | **PES-1** | | Evaluate the estimating and scheduling process of the project to ensure that the project planning assumptions, budget and resources are adequate to support the work-breakdown structure and schedule. |  | |  |
| **PES-2** | | Examine historical data and data sources to determine if the project team has accurately estimated the schedule, labor requirements and cost of product, service or system development efforts. |  | |  |
| **PES-3** | | Examine historical data and data sources to determine if the project has been able to accurately accumulate the budgeted/planned costs and actual costs of tasks completed for the project. | Minor Finding: Earned value is calculated monthly using the data contained in the Microsoft Project plan:   * + - * + Task completion is the baseline for DDD earned value analysis. Tasks are only considered 0%, 50% or 100% complete (i.e., the PMI 50% rule) to ensure that task completion is more objective.         + Deliverable completion is the baseline for Sogeti earned value analysis.   Portions of the plan were re-baselined due to schedule changes after the programming language change decision, but the overall end date of the project was not changed. | | The project team should continue to report project performance.  DDD should document the lessons learned/best practices from the project for use in future development efforts. |
| **PES-4** | | Compare and evaluate the status of the planned and actual costs being reported for the project on the Commonwealth IT Project Status Report. Ensure they match what is being reported to the IAOC. |  | |  |
| **PES-5** | | Evaluate the nature and amount of cost variance between the budgeted and actual costs to the project to date. |  | |  |
| **PES-6** | | Verify that Internal Agency Oversight Committee (IAOC) approved the Planned Costs for the Project, including the date when the Planned Costs received approval from the IAOC. |  | |  |
| **Project Personnel** | | **PP-1** | | Examine the job assignments, skills, training and experience of the personnel involved in program development to verify that they are adequate for the development task. |  | |  |
| **PP-2** | | Evaluate the project’s personnel planning for the project to verify that adequate human resources will be available for development and maintenance. |  | |  |
| **PP-3** | | Evaluate the project’s personnel policies to verify that staff turnover will be minimized. |  | |  |
| **Project Organization** | | **PO-1** | | Verify that lines of reporting and responsibility provide adequate technical, financial and managerial oversight of the project. |  | |  |
| **PO-2** | | Verify that the project’s organizational structure supports training, process definition, risk management, quality assurance, configuration management, product testing and any other functions critical for the project’s success. |  | |  |
| **Contractor Utilization**  **and**  **Oversight** | | **CES-1** | | Evaluate the use of contractors for project development. If Contractors are utilized; verify that the obligations of contractors and external staff (terms, conditions, statement of work, requirements, standards, development milestones, acceptance criteria, delivery dates, etc.) are clearly defined. |  | |  |
| **CES-2** | | Evaluate the use of contractors for project development. If Contractors are utilized; verify that the obligations of contractors and external staff (terms, conditions, statement of work, requirements, standards, development milestones, acceptance criteria, delivery dates, etc.) are clearly defined. |  | |  |
| **CES-3** | | Verify that the contractors’ software development methodology and product standards are compatible with the system’s standards and environment. | Positive Finding: DDD has adopted the contractor’s waterfall implementation methodology and processes for this project. The contractor methodology and templates map closely to VITA PMD standards and have provided significant structure and discipline to the implementation. | | The project team should continue to leverage the contractor implementation methodology for the remainder of this project. |
| **CES-4** | | Verify that the contractor has and maintains the required skills, personnel, plans, resources, procedures and standards to meet their commitment. This will include examining the feasibility of any offsite support of the project. |  | |  |
| **CES-5** | | Verify that any proprietary tools used by contractors do not restrict the future maintainability, portability, and reusability of the system. |  | |  |
|  | | **CES-6** | | Verify that the project management has defined the technical and managerial inputs the contractor needs (reviews, approvals, requirements, and interface clarifications, etc.) and has the resources to supply them on schedule. |  | |  |
| **Quality Management** | | **QM-1** | | Evaluate and make recommendations on the project’s quality assurance (QA) processes, procedures and organization. | Minor Finding: DDD has a System Quality Assurance (SQA) group within DDD IT, but they have not been involved with this project to date due to other project commitments. It should be noted that the project team has attempted to engage the SQA group repeatedly over the course of the project to gain an independent view of the project’s health. SQA involvement will continue to be sought until the project is complete. | | The project team and sponsors should continue to reach out to the SQA group and insist on the group’s involvement over the final months of the project. Regardless, on future development projects, DDD should ensure the involvement of the SQA group to provide in-house oversight and independent quality assurance. |
| **QM-2** | | Verify that QA has an appropriate level of independence from project management. |  | |  |
| **QM-3** | | Verify that the quality of all products produced by the project is monitored by formal reviews and sign-offs. |  | |  |
| **QM-4** | | Monitor the performance of the QA resource(s) by reviewing its processes and reports and performing spot checks of system documentation; assess findings and performance of the processes and reports. |  | |  |
| **QM-5** | | Verify that the QA resource provides periodic assessment of the project activities. |  | |  |
| **Process Definition**  **and**  **Product Standards** | | **PDPS-1** | | Review and make recommendations on all defined processes and product standards associated with the system development. |  | |  |
| **PDPS-2** | | Verify that all major development processes are defined and that the defined and approved processes and standards are followed in development. |  | |  |
| **PDPS-3** | | Verify that the processes and standards are compatible with each other and with the system development methodology. |  | |  |
| **PDPS-4** | | Verify that all process definitions and standards are complete, clear, up-to-date, consistent in format, and easily available to project personnel. |  | |  |
| **User Training and Documentation** | | **UTD-1** | | Review and make recommendations on the training provided to product users. Verify that sufficient knowledge transfer occurs for the maintenance and operation of the new product. |  | |  |
| **UTD-2** | | Verify that training is user-friendly and training materials directly relate to end user needs. Validate that O&M services are easily available to all users. |  | |  |
| **UTD-3** | | Verify that all necessary policies, processes, and documentation are easily available to users. |  | |  |
| **UTD-4** | | Verify that all training is given on time and is evaluated and monitored for effectiveness, with additional training provided as needed. |  | |  |
| **Developer Training and Documentation** | | **DTD-1** | | Review and make recommendations on the training provided to system developers. |  | |  |
| **DTD-2** | | Verify that developer training is technically adequate, appropriate for the development phase, and available at appropriate times. |  | |  |
| **DTD-3** | | Verify that all necessary policies, processes and standards documentation are easily available to developers. |  | |  |
| **DTD-4** | | Verify that all training is given on time and is evaluated and monitored for effectiveness, with additional training provided as needed. |  | |  |
| **Requirements Management** | | **REQ-1** | | Evaluate and make recommendations on the project’s process and procedures for managing requirements. |  | |  |
| **REQ-2** | | Verify that system requirements are well defined, understood, and documented. | Positive Finding: System requirements were well documented in the RFP. This project is strictly a system infrastructure project and will have no impact on end-users.  Lower-level technical requirements have been dealt with as the project has progressed and technical issues have arisen. Technical issues are being tracked and managed in the Complexity Analysis and Solution Design Guide (CASDG). | | DDD should establish a more rigorous technical specification process for future development efforts. |
| **REQ-3** | | Evaluate the allocation of system requirements to hardware and software requirements. |  | |  |
| **REQ-4** | | Validate that software requirements can be traced through design, code and test phases to verify that the system performs as intended and contains no unnecessary software elements. |  | |  |
| **REQ-5** | | Verify that requirements are under formal configuration control. |  | |  |
| **Security and Privacy Requirements** | | **SPR-1** | | Evaluate and make recommendations on project policies and procedures for ensuring that the system is secure and that the privacy of client data is maintained. |  | |  |
| **SPR-2** | | Evaluate the project’s restrictions on system and data access. |  | |  |
| **SPR-3** | | Evaluate the project’s security and privacy risk analyses. |  | |  |
| **SPR-4** | | Verify that processes and equipment are in place to back up client and project data and files and archive them safely at appropriate intervals. |  | |  |
| **Requirements Analysis** | | **RA-1** | | Verify that an analysis of user needs and objectives has been performed to verify that requirements of the system are well understood, well defined, and satisfy any regulatory requirements. | N/A – No changes that affect the end user are included in this project. The existing underlying system is being reengineered into a new technology platform and tool set. The system changes will be transparent to the end user. | | N/A |
| **RA-2** | | Verify that all stakeholders have been consulted to the desired functionality of the system, and that users have been involved in prototyping of the user interface. |  | |  |
| **RA-3** | | Verify that all stakeholders have agreed to all changes that impact project cost, schedule or performance. |  | |  |
| **RA-4** | | Verify that performance requirements (e.g. timing, response time and throughput) satisfy user needs. |  | |  |
| **RA-5** | | Verify that user’s operations and maintenance requirements for the system are completely specified. |  | |  |
| **Interface Requirements** | | **IR-1** | | Verify that all system interfaces are exactly described, by medium and by function, including input/output control codes, data format, polarity, range, units, and frequency. |  | |  |
| **IR-2** | | Verify those approved interface documents are available and that appropriate relationships (such as interface working groups) are in place with all agencies and organizations supporting the interfaces. |  | |  |
| **IR-3** | | Verify that all external and internal system and software interface requirements have been identified. |  | |  |
| **IR-4** | | Verify that each interface is described and that the interface description includes data format and performance criteria (e.g., timing, bandwidth, accuracy, safety, and security). |  | |  |
| **Requirements Allocation and Specification** | | **RAS-1** | | Verify that all system requirements have been allocated to either a software or hardware subsystem. |  | |  |
| **RAS-2** | | Verify that requirements specifications have been developed for all hardware and software subsystems in a sufficient level of detail to ensure successful implementation. |  | |  |
| **RAS-3** | | Verify that performance requirements (e.g., timing, response time, and throughput) allocated to hardware, software, and user interfaces satisfy user needs. |  | |  |
| **RAS-4** | | Verify that the internal and external interfaces specify the data formats, interface protocols, frequency of data exchange at each interface, and other key performance requirements to demonstrate compliance with user requirements. |  | |  |
| **RAS-5** | | Verify that application specific requirements, such as functional diversity, fault detection, fault isolation, and diagnostic and error recovery satisfy user needs. |  | |  |
| **RAS-6** | | Verify that the user’s maintenance requirements for the system are completely specified. |  | |  |
| **RAS-7** | | Validate that there are objective acceptance testing criteria for validating the requirements of the requirements specification documents. |  | |  |
| **Development Hardware** | | **DH-1** | | Evaluate new and existing development hardware configurations to determine if their performance is adequate to meet the needs of system development. |  | |  |
| **DH-2** | | Determine if hardware is maintainable, easily upgradeable, and compatible with the agency’s existing development and processing environment. This evaluation should include, but is not limited to CPUs and other processors, memory, network connections and bandwidth, communication controllers, telecommunications systems (LAN/WAN), terminals, printers and storage devices. |  | |  |
| **DH-3** | | Current and projected vendor support of the hardware should also be evaluated, as well as the agency’s hardware configuration management plans and procedures. |  | |  |
| **Development Software** | | **DS-1** | | Evaluate new and existing development software to determine if its capabilities are adequate to meet system development requirements. |  | |  |
| **DS-2** | | Determine if the software is maintainable, easily upgradeable, and compatible with the agency’s current hardware and software environment. |  | |  |
| **DS-3** | | Evaluate the development environment as a whole to see if it shows a degree of integration compatible with good development. This evaluation should include, but is not limited to, operating systems, network software, CASE tools, project management software, configuration management software, compilers, cross-compilers, linkers, loaders, debuggers, editors, and reporting software. |  | |  |
| **DS-4** | | Language and compiler selection should be evaluated with regard to portability and reusability (ANSI standard language, non-standard extensions, etc.) |  | |  |
| **DS-5** | | Current and projected vendor support of the software should also be evaluated, as well as the agency’s software acquisition plans and procedures. |  | |  |
| **Detailed Design** | | **DD-1** | | Evaluate and make recommendations on existing detailed design products to verify that the design is workable, efficient, and satisfies all high-level design requirements. |  | |  |
| **DD-2** | | Evaluate the design products for adherence to the project design methodology and standards. |  | |  |
| **DD-3** | | Evaluate and make recommendations on the design and analysis process used to develop the design. |  | |  |
| **DD-4** | | Evaluate and make recommendations on the design standards, methodology and CASE tools used. |  | |  |
| **DD-5** | | Verify that design elements can be traced back to system requirements and high-level design elements. |  | |  |
| **DD-6** | | Determine if the relationship between the design elements and the high-level design elements are specified to a constant level of detail. |  | |  |
| **DD-7** | | Verify that all design products are under configuration control and formally approved before coding begins. |  | |  |
| **Coding** | | **C-1** | | Evaluate and make recommendations on thestandards and processes currently in place for code development. |  | |  |
| **C-2** | | Evaluate the existing code base for portability and maintainability, taking software metrics including but not limited to modularity, complexity and source and object size. |  | |  |
| **C-3** | | Evaluate code documentation for quality, completeness (including maintenance history) and accessibility. |  | |  |
| **C-4** | | Evaluate the coding standards and guidelines and the projects compliance with these standards and guidelines. This evaluation should include, but not be limited to, structure, documentation, modularity, naming conventions and format. |  | |  |
| **C-5** | | Verify that developed code is kept under appropriate configuration control and is easily accessible by developers. |  | |  |
| **C-6** | | Evaluate the project’s use of software metrics in management and quality assurance. |  | |  |
| **C-7** | | Verify and validate that code components satisfy the detailed design. |  | |  |
| **C-8** | | Validate that the logic, computational, and interface precision (e.g., truncation and rounding) satisfy the requirements in the system environment. |  | |  |
| **Unit Testing** | | **UT-1** | | Evaluate the plans, requirements, environment, tools, and procedures used for unit testing system modules. |  | |  |
| **UT-2** | | Evaluate the level of test automation, interactive testing and interactive debugging available in the test environment. |  | |  |
| **UT-3** | | Verify that an appropriate level of test coverage is achieved through the testing process, that test results are verified, that the correct code configuration has been tested, and that the tests are appropriately documented, including formal logging of errors found in testing. |  | |  |
| **UT-4** | | Validate that the unit test plan satisfies the following criteria: Traceable to the software requirements and design; External consistency with the software requirements and design; Internal consistency between unit requirements; Test coverage of requirements in each component; Feasibility of software integration and testing; and Feasibility of operation and maintenance (e.g., capability to be operated and maintained in accordance with user needs). |  | |  |
| **UT-5** | | a. Validate that the results of the Unit Testing of each software configuration item indicates that the item correctly implements the software design for the item as documented in the software design documentation for that item.  b. Document the results as required by the test plan.  c. Validate that the results of the Unit Testing of each software configuration item satisfies the test acceptance criteria as specified in the Unit Test Plan.  d. Document discrepancies between actual and expected test results. |  | |  |
| **Integration Testing** | | **IT-1** | | Evaluate the plans, requirements, environment, tools, and procedures used for integration testing of system modules. |  | |  |
| **IT-2** | | Evaluate the level of automation and the availability of the integration test environment. |  | |  |
| **IT-3** | | Verify that an appropriate level of test coverage is achieved through the test process, that test results are verified, that the correct code configuration has been tested, and that the tests are appropriately documented, including formal logging of errors found in testing. |  | |  |
| **IT-4** | | Validate that the integration test plan satisfies the following criteria: Traceable to the software requirements and design; External consistency with the software requirements and design; Internal consistency between unit requirements; Test coverage of requirements in each component; Feasibility of software integration and testing; and Feasibility of operation and maintenance (e.g., capability to be operated and maintained in accordance with user needs). |  | |  |
| **IT-5** | | Verify that the test organization has an appropriate level of independence from the development organization. |  | |  |
| **IT-6** | | a. Validate that the results of the Integration Testing of each software configuration item indicates that the item correctly implements the software design for the item as documented in the software design documentation for that item.  b. Document the results as required by the test plan.  c. Validate that the results of the Integration Testing of each software configuration item satisfies the test acceptance criteria as specified in the Integration Test Plan.  d. Document discrepancies between actual and expected test results. |  | |  |
| **System Testing** | | **ST-1** | | Evaluate the plans, requirements, environment, tools, and procedures for system testing of the system. |  | |  |
| **ST-2** | | Evaluate the level of automation and the availability of the system test environment. |  | |  |
| **ST-3** | | Verify that a sufficient number and type of case scenarios are used to ensure comprehensive but manageable testing and that tests are run in a realistic, real-time environment. |  | |  |
| **ST-4** | | Verify that test scripts are complete, with step-by-step procedures, required pre-existing events or triggers, and expected results. |  | |  |
| **ST-5** | | Verify that test results are verified, that the correct code configuration has been used, and that the test runs are appropriately documented, including formal logging of errors found in testing. |  | |  |
| **ST-6** | | Validate that the system test plan satisfies the following criteria: Traceable to the software requirements and design; External consistency with the software requirements and design; Internal consistency between unit requirements; Test coverage of requirements in each component; Feasibility of software integration and testing; and Feasibility of operation and maintenance (e.g., capability to be operated and maintained in accordance with user needs). |  | |  |
| **ST-7** | | Verify that the test organization has an appropriate level of independence from the development organization. |  | |  |
| **ST-8** | | a. Validate that the results of the System Testing of each software configuration item indicates that the item correctly implements the software design for the item as documented in the software design documentation for that item.  b. Document the results as required by the test plan.  c. Validate that the results of the System Testing of each software configuration item satisfies the test acceptance criteria as specified in the System Test Plan.  d. Document discrepancies between actual and expected test results. |  | |  |
| **Interface Testing** | | **IT-1** | | Evaluate the plans, requirements, environment, tools, and procedures for interface testing of the system. |  | |  |
| **IT-2** | | Evaluate the level of automation and the availability of the system test environment. |  | |  |
| **IT-3** | | Verify that a sufficient number and type of case scenarios are used to ensure comprehensive but manageable testing and that tests are run in a realistic, real-time environment. |  | |  |
| **IT-4** | | Verify that test scripts are complete, with step-by-step procedures, required pre-existing events or triggers, and expected results. |  | |  |
| **IT-5** | | Verify that test results are verified, that the correct code configuration has been used, and that the test runs are appropriately documented, including formal logging of errors found in testing. |  | |  |
| **IT-6** | | Validate that the interface test plan satisfies the following criteria: Traceable to the software requirements and design; External consistency with the software requirements and design; Internal consistency between unit requirements; Test coverage of requirements in each component; Feasibility of software integration and testing; and Feasibility of operation and maintenance (e.g., capability to be operated and maintained in accordance with user needs). |  | |  |
| **IT-7** | | Verify that the test organization has an appropriate level of independence from the development organization. |  | |  |
|  | | **IT-8** | | a. Validate that the results of the Interface Testing of each software configuration item indicates that the item correctly implements the software design for the item as documented in the software design documentation for that item.  b. Document the results as required by the test plan.  c. Validate that the results of the Interface Testing of each software configuration item satisfies the test acceptance criteria as specified in the Interface Test Plan.  d. Document discrepancies between actual and expected test results. |  | |  |
| **Acceptance Testing** | | **AT-1** | | Evaluate the plans, requirements, environment, tools, and procedures for acceptance testing of the system. |  | |  |
| **AT-2** | | Verify that acceptance procedures and acceptance criteria for each product are defined, reviewed, and approved prior to tests and that test results are documented. Acceptance procedures must also address the process by which any software product that does not pass acceptance testing will be corrected. |  | |  |
| **AT-3** | | Verify that a sufficient number and type of case scenarios are used to ensure comprehensive but manageable testing and that tests are run in a realistic, real-time environment. |  | |  |
| **AT-4** | | Verify that test scripts are complete, with step-by-step procedures, required pre-existing events or triggers, and expected results. |  | |  |
| **AT-5** | | Verify that test results are verified, that the correct code configuration has been used, and that the test runs are appropriately documented, including formal logging of errors found in testing. |  | |  |
| **AT-6** | | Validate that the acceptance test plan satisfies the following criteria: Traceable to the software requirements and design; External consistency with the software requirements and design; Internal consistency between unit requirements; Test coverage of requirements in each component; Feasibility of software integration and testing; and Feasibility of operation and maintenance (e.g., capability to be operated and maintained in accordance with user needs). |  | |  |
| **AT-7** | | Verify that the acceptance test organization has an appropriate level of independence from the subcontractor. |  | |  |
| **AT-8** | | Validate that appropriate acceptance testing based on the defined acceptance criteria is performed satisfactorily before acceptance of software products. |  | |  |
| **AT-9** | | Verify that the process by which any software product that does not pass acceptance testing should be corrected has been defined and documented. |  | |  |
| **AT-10** | | a. Validate that the results of the Acceptance Testing of each software configuration item indicates that the item correctly implements the software design for the item as documented in the software design documentation for that item.  b. Document the results as required by the test plan.  c. Validate that the results of the Acceptance Testing of each software configuration item satisfies the test acceptance criteria as specified in the Acceptance Test Plan.  d. Document discrepancies between actual and expected test results. |  | |  |
| **Implementation** | | **I-1** | | Review and evaluate implementation planning. |  | |  |
| **I-2** | | Verify that all software products required to install and operate each software component being implemented by the project are present in the software component’s installation package. |  | |  |
| **I-3** | | Validate that all site-dependent parameters or conditions to verify supplied values are correct. |  | |  |
| **Data Conversion/Migration** | | **DC-1** | | Evaluate the agency’s existing and proposed plans, procedures and software for data conversion. |  | |  |
| **DC-2** | | Verify that procedures are in place and are being followed to review the converted data for completeness and accuracy and to perform data cleanup as required. |  | |  |
| **DC-3** | | Determine conversion error rates and if the error rates are manageable. |  | |  |
| **DC-4** | | Make recommendations on making the conversion process more efficient and on maintaining the integrity of data during the conversion. |  | |  |
| **Database Design** | | **DBD-1** | | Evaluate new and existing database designs to determine if they meet existing and proposed system requirements. |  | |  |
| **DBD-2** | | Recommend improvements to existing designs to improve data integrity and system performance. |  | |  |
| **DBD-3** | | Evaluate the design for maintainability, scalability, concurrence, normalization (where appropriate) and any other factors affecting performance and data integrity. |  | |  |
| **DBD-4** | | Evaluate the project’s process for administering the database, including backup, recovery, performance analysis and control of data item creation. |  | |  |
| **System Hardware** | | **SH-1** | | Determine if hardware is compatible with the agency’s existing processing environment, if it is maintainable, and if it is easily upgradeable. This evaluation should include, but is not limited to CPUs and other processors, memory, network connections and bandwidth, communication controllers, telecommunications systems (LAN/WAN), terminals, printers and storage devices. |  | |  |
| **SH-2** | | Evaluate current and projected vendor support of the hardware, as well as the agency’s hardware configuration management plans and procedures. |  | |  |
| **System Software** | | **SS-1** | | Evaluate new and existing system software to determine if its capabilities are adequate to meet existing and proposed system requirements. |  | |  |
| **SS-2** | | Determine if the software is compatible with the agency’s existing hardware and software environment, if it is maintainable, and if it is easily upgradeable. This evaluation should include, but is not limited to, operating systems, middleware, and network software including communications, file-sharing protocols, etc. |  | |  |
| **SS-3** | | Current and projected vendor support of the software should also be evaluated, as well as the agency’s software acquisition plans and procedures. |  | |  |
| **Database Software** | | **DBS-1** | | Evaluate new and existing database products to determine if their capabilities are adequate to meet existing and proposed system requirements. |  | |  |
| **DBS-2** | | Determine if the database’s data format is easily convertible to other formats, if it supports the addition of new data items, if it is scaleable, if it is easily refreshable and if it is compatible with the agency’s existing hardware and software. |  | |  |
| **DBS-3** | | Evaluate any current and projected vendor support of the software, as well as the agency’s software acquisition plans and procedures. |  | |  |
| **Hardware and Software Environment Capacity** | | **HSEC-1** | | Evaluate the existing processing capacity of the planned hardware and software environment and verify that it is adequate for projected system. |  | |  |
| **HSEC-2** | | Evaluate the historic availability and reliability of the current hardware and software environment, including the frequency and criticality of failures. |  | |  |
| **HSEC-3** | | Evaluate the results of any volume testing or stress testing. |  | |  |
| **HSEC-4** | | Evaluate any existing measurement and capacity-planning program and evaluate the hardware and software environment’s capacity to support future growth. |  | |  |
| **HSEC-5** | | Make recommendations on changes in processing hardware, storage, network systems, operating systems, COTS software, and software design to meet future growth and improve system performance. |  | |  |
| **Change Tracking** | | **CT-1** | | Evaluate the system change request and defect tracking processes. |  | |  |
| **CT-2** | | Evaluate the implementation of the product change request and defect tracking process activities and request volumes to determine if processes are effective and are being followed. |  | |  |
| **Goals**  **and**  **Objectives** | | **GO-1** | | Evaluate impact of the product on operational goals and performance objectives. |  | |  |
| **Documentation** | | **DOC-1** | | Evaluate operational documentation. |  | |  |
| **Operational Processes** | | **OP-1** | | Evaluate the implementation of operational processes including backup, disaster recovery and day-to-day operations to verify the processes are being followed. |  | |  |
| **SaaS Testing** | | **ST-1** | | Verify that Data testing validates that data migrated to the SaaS application matches the current application, including both static data migration and data transformation, and the states of the data in the integrations. |  | |  |
| **ST-2** | | Verify that testing validates network bandwidth and ensures accurate and secure data transfer between the SaaS application and the COV network |  | |  |
| **ST-3** | | Verify integration testing involves validating the interfaces between the SaaS application and organization's legacy applications if one exists. |  | |  |
| **SaaS Disaster Recovery** | | **SDR-1** | | Validate that the vendor disaster recovery, availability, and reliability of the SaaS application meet Commonwealth Standards |  | |  |
| **SaaS Operational Processes** | | **SOP-1** | | Verify the existence and institutionalization of an operational plan for ensuring the vendor provides ongoing reporting related to the ECOS assessment. |  | |  |
| **Disaster Recovery** | **SDR-1** | | Validate that the vendor disaster recovery, availability, and reliability of the SaaS application meet Commonwealth Standards | | |  | | |
| **Operational Processes** | **SOP-1** | | Verify the existence and institutionalization of an operational plan for ensuring the vendor provides ongoing reporting related to the ECOS assessment. | | |  | | |

**Attachment 4: IT Project Best Practices**

The *(Enter Name of Major IT Project)* Project *(Enter Type of IV&V Review)* IV&V Review observed these Best Practices during review of the project. The updated/provided best practices matrix is shown below. (*The type of information required and examples for filling out the blocks are provided below.)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Title | Best Practice | Observation | Project Phase | Comment |
| Virginia Base Mapping Program | Collaboration between multi tiered agencies toestablish  and maintain one consistent, accurate,  foundational digital base map upon which  local government and many regional, state,  and federal geospatial data applications  could be built. | The VBMP statewide imagery has produced  a single consistent, seamless base  map, providing the foundation for a consistent  enterprise architecture for GIS throughout  Virginia. This ensures that data sharing  for state and local, public and private business.  . | *All* | VGIN contracted  with VARGIS LLC. of Herndon,  Virginia, to produce full color, "leaf-off", digital  orthophotography for the entire land base  of Virginia. The imagery was developed at  one of three scales, determined by evaluating  population and housing densities. |

**Appendix 5: IT Project Lessons Learned**

The *(Enter Name of Major IT Project)* Project *(Enter Type of IV&V Review)* IV&V Review updated/provided “Lessons Learned” found during contact with project personnel. The updated/provided lesson learned matrix is shown below. (*The type of information required and examples for filling out the blocks are provided below.)*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Title | Lesson Learned Statement | Observation | Project Phase | Impact on Cost | Impact on Schedule | Impact on Quality | Recommended Action |
| Vendor Relationship | Vendor relationships are influenced by many factors. It is important to find out what motivates your vendors. | Not understanding the vendor's situation can lead to misunderstandings and incorrect expectations. | All Phases  *(Initiation, Planning, Execution & Control, Closeout or All)* | Low  *(Low, Medium, High)* | Low  *(Low, Medium, High)* | Low  *(Low, Medium, High)* | Understand the presence your vendor has in the market, the maturity of the vendor’s product, how large a part you are of their customer base and the importance of their product in your system. |
|  |  |  |  |  |  |  |  |
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