



# OFFICE OF INSPECTOR GENERAL

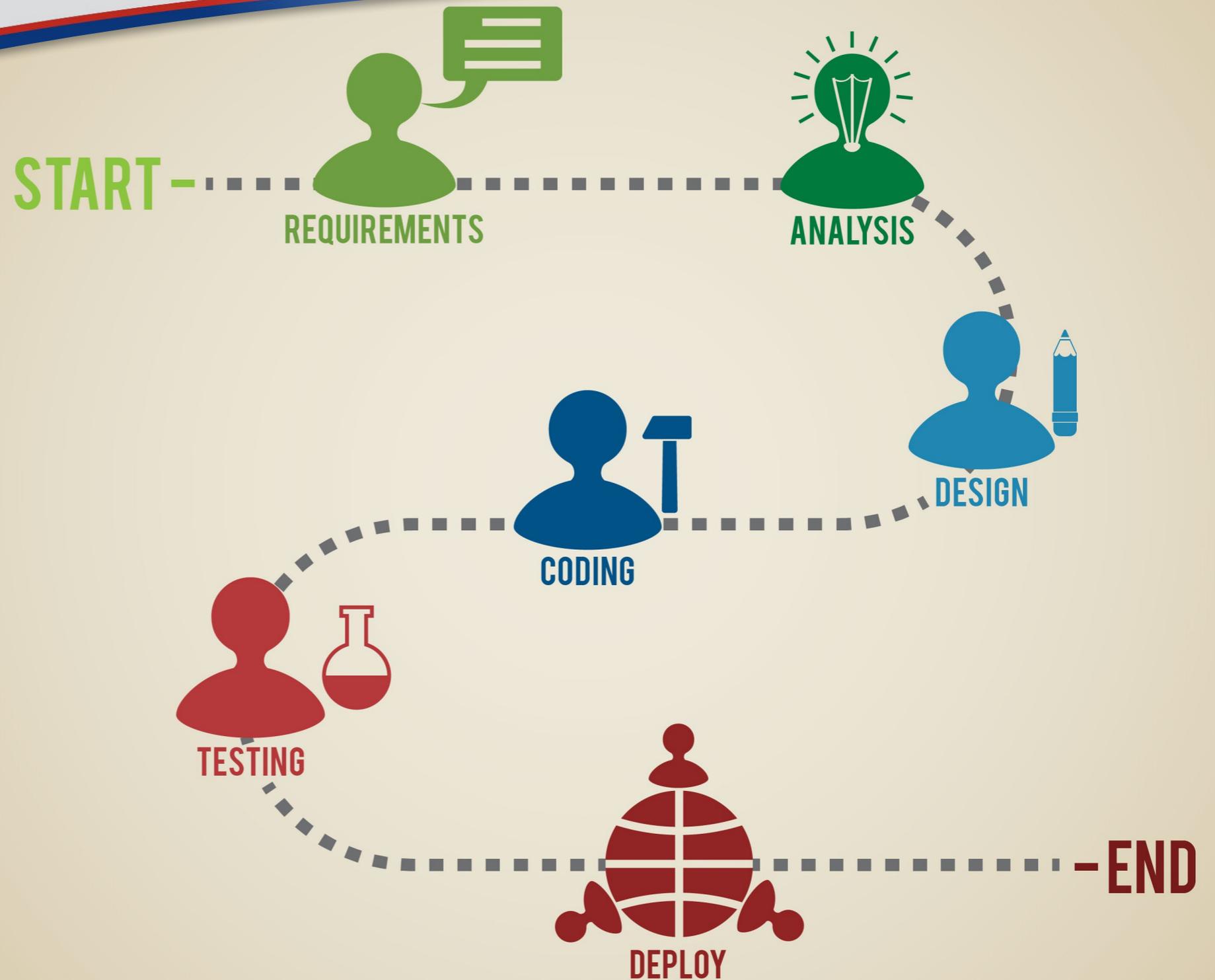
## UNITED STATES POSTAL SERVICE

### Software Development Processes

### Audit Report

Report Number  
IT-AR-15-006

July 13, 2015





# OFFICE OF INSPECTOR GENERAL

## UNITED STATES POSTAL SERVICE

## Highlights

***The Postal Service does not consistently manage software development risk.***

### Background

Organizations spend significant resources developing, acquiring, and maintaining applications that manage critical information. To ensure proper governance over software development, the U.S. Postal Service uses development processes to ensure proper design, development, and testing of each new or modified application. The Postal Service has one of the country's largest retail networks and has developed over 2,200 software applications to manage its business activities.

The Postal Service uses various processes to ensure each new or modified application is properly designed, developed, and tested. To remain competitive, it must use technology that continues to meet customer needs and achieve business goals. Currently, there are about 100 applications under development to optimize the value of the postal infrastructure and leverage technology to drive business value.

Our objective was to determine whether the Postal Service's software development processes are adequate to manage development risk and reflect best practices.

### What The OIG Found

The Postal Service does not consistently manage software development risk or properly develop and maintain documentation for applications in accordance with current Postal Service policies. We found that project teams are not

always executing the required phases of the development process. Also, non-national (field) applications do not always adhere to the approved development processes and are not included in the governance and compliance process.

Further, we found the current governance and compliance review process does not ensure all software development complies with Postal Service policies. Finally, management is not consistently maintaining application status and proper documentation in the required repositories. We determined that management did not maintain 1,100 of the 3,451 required documents for the 71 applications we sampled.

These issues exist because current policy does not clearly define roles and responsibilities for documenting system requirements and testing system functionality. In addition, software development processes do not address non-national application development. Finally, management does not conduct quality reviews or follow-up to ensure all phases of the process are complete.

Without an adequate software development process, the Postal Service risks developing applications that do not meet customer needs or achieve business goals. In addition, there is a higher risk of cost overruns and project delays, which limit the organization's ability to optimize infrastructure and leverage technology to drive business value. We identified potential schedule delays and cost overruns of about \$4.5 million.



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### What The OIG Recommended

We recommended management define specific roles and responsibilities for the requirements and testing phases and ensure that all system requirements are documented and tested prior to migration to production. We also recommended management train personnel to test correctly. Finally, we recommended management revise policies to require quality reviews, update application status, and upload documentation at the completion of each development phase. Because of the 2014 cyber intrusion, management disallowed non-national application development; therefore, we are not recommending further action on this issue.

# Transmittal Letter

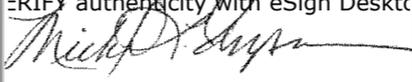


OFFICE OF INSPECTOR GENERAL  
UNITED STATES POSTAL SERVICE

July 13, 2015

**MEMORANDUM FOR:** JUDITH A. ADAMS  
ACTING VICE PRESIDENT,  
INFORMATION TECHNOLOGY

MICHAEL J. AMATO  
VICE PRESIDENT, ENGINEERING SYSTEMS

E-Signed by Michael Thompson  
VERIFY authenticity with eSign Desktop  


**FROM:** Michael L. Thompson  
Acting Deputy Assistant Inspector General  
for Technology, Investment, and Cost

**SUBJECT:** Audit Report – Software Development Processes  
(Report Number IT-AR-15-006)

This report presents the results of our review of U.S. Postal Service's Software Development Processes (Project Number 15TG004IT000).

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact Aron B. Alexander, director, Information Technology, or me at 703-248-2100.

Attachment

cc: Corporate Audit and Response Management

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# Findings

## Introduction

This report presents the results of our audit of the U.S. Postal Service's Software Development Processes (Project Number 15TG004IT000). Our objective was to determine whether the Postal Service's software development processes are adequate to manage development risk and reflect best practices. See [Appendix A](#) for additional information about this audit.

The software development life cycle is used to develop or modify applications, first by identifying a need for software and extending through design and development, testing, acceptance and approval, and maintenance. An individual or group should be assigned responsibility for each phase so that system design, development, and maintenance progress smoothly and accurately.

For the Postal Service to remain competitive, it is essential that its technology meets customers' needs and business goals. The Postal Service implemented two development methodologies to leverage technology and respond to customer needs. The type of application or equipment being developed determines which methodology is used. All development, acquisition, and maintenance projects must follow either the Software Development Life Cycle (SDLC)<sup>1</sup> or the Technology Solutions Life Cycle (TSLC).<sup>2</sup> The SDLC and TSLC phases include activities that must be performed to maintain a secure environment and comply with Postal Service policies.

The SDLC is based on a development process that requires the sequential design of software. Alpha and Beta tests are the phases of this process where application functions and features are tested. Alpha testing validates all system requirements and interface functionality and demonstrates the system is ready for testing in a live environment. Beta testing ensures that all requirements and interfaces are validated and identifies defects.

The TSLC is based on a development process, which allows for rapid development and collaboration between developers and customers. System Integration Testing (SIT) and Customer Acceptance Testing (CAT) are similar to the SDLC's Alpha and Beta testing. SIT testing validates that an application conforms to design specifications and requirements and identifies and corrects problems in the application before installation. CAT testing ensures the application satisfies the documented requirements and is approved by the business owner.

Following each phase of the life cycle increases the likelihood that a new or modified application meets specific business and user needs and that systems will have proper controls in place once deployed.

## Conclusion

The Postal Service does not consistently manage software development risk or properly develop and maintain documentation for applications in accordance with current Postal Service policies. For example, project teams are not always executing all required phases of their software development process. In addition, non-national applications<sup>3</sup> do not always adhere to the approved development processes and are not included in the governance and compliance process. Further, the current governance and compliance review process does not ensure that all software development complies with Postal Service policies. Finally, management is not consistently maintaining application status and final development documentation in the required repositories.<sup>4</sup>

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1 The Postal Service Engineering Systems software development methodology for developing and deploying equipment and new systems.

2 The Postal Service Information Technology (IT) software development methodology used to develop and maintain technology solutions such as applications.

3 Local applications developed by field personnel for their use only.

4 The TSLC Artifacts Library is a document repository that contains finalized project documentation for all applications.

# Technology Solutions Life Cycle (TSLC) Process

**Project teams are not properly developing and obtaining applications requirements and conducting system and customer tests.**

These issues exist because current policy does not clearly define roles and responsibilities for documenting system requirements and testing system functionality. In addition, software development processes do not address non-national application development. Finally, management does not conduct quality reviews or follow-up to ensure that all phases of the process are complete. Without an adequate software development process, the Postal Service is at risk of developing applications that do not meet customers' needs or achieve business goals. Also, because the development process is inadequate, there is a higher risk of cost overruns and project delays, which limit the organization's ability to optimize infrastructure and leverage technology to drive business value. We identified potential schedule delays and cost overruns valued at about \$4.5 million.

### Incomplete Requirements and Test Phase

Project teams using SDLC and TSLC are not properly developing and obtaining applications requirements and conducting system and customer tests as required by the software development process.<sup>5</sup> We sampled 71<sup>6</sup> applications and found the following issues related to the requirements and testing phases:

#### Requirements Phase

- We found two instances<sup>7</sup> where requirements were developed during the test phase as opposed to the requirements phase, and one instance where testing occurred before development was complete.
- We found two instances where the customer<sup>8</sup> did not prepare the initial application requirements according to TSLC process<sup>9</sup> and, instead, the developer prepared the requirements.
- We identified 37 instances where no application requirements were uploaded into the TSLC Artifacts Library and 13 instances where incorrect documents were uploaded.

#### Testing Phase

- We identified 136 instances where system and customer testing was not performed.
- We found 47 instances where the customer did not conduct independent acceptance testing as required and; instead, testers used the same test scripts to perform both system and user testing.

This occurred because current policies<sup>10</sup> do not clearly define who is responsible for performing the TSLC requirements, design, and testing phases. In addition, customers lack the knowledge to perform CAT testing. Finally, test environments were not always prepared for testing, as required by policy,<sup>11</sup> and test exemptions<sup>12</sup> were not always obtained. As a result, the Postal Service is at risk of developing applications that do not meet customers' needs or achieve business goals. In addition, there is a higher risk of excessive cost overruns and project delays due to increased development and operational costs for reworking issues and fixing system defects. Moreover, the development team could inadvertently introduce errors into the system or code that could expose confidential and sensitive information.

5 TSLC Agile Sprint 0/Requirements Process, Purpose Section, updated March 18, 2014; and Handbook AS-805, *Information Security*, Section 10-4, Testing of Hardware and Software, May 2014.

6 Our sample consisted of five SDLC-developed applications and 66 TSLC-developed applications.

7 An instance refers to a case or occurrence of anything.

8 The organization requesting the new application or modification to existing applications.

9 TSLC Agile Sprint 0/Requirements Process, Purpose Section, updated March 18, 2014.

10 TSLC Policy, Process Description Section, Requirements, Design, and Testing, March 18, 2014.

11 Handbook AS-805, Section 8.3.1, Distributed Postal Computing Environments; and Section 8.3.3, Testing Restrictions, May 2014.

12 Refers to the forms and approval required when testing cannot be performed in either the SIT or CAT environments.

**Management is not using the TSLC scorecard to ensure all software development complies with the Postal Service's TSLC policies and compliance standards.**

### Non-National Applications Do Not Follow Development Policies

Some field locations developed applications without following an approved methodology. These applications were connected to network resources but were not controlled by the Chief Information Officer (CIO) organization. This occurred because field managers gave untrained personnel access to production and test environments to develop local applications. This type of shadow development<sup>13</sup> was not visible to IT management due to a decentralized approval process. As a result, these applications introduced vulnerabilities into the Postal Service network, some of which were exploited during the 2014 cyber intrusion.

On November 9, 2014, management took corrective action by revoking untrained field personnel's access to production and test environments. Management also reviewed about 300 non-national applications and removed all but 18 from production.<sup>14</sup> In addition, management updated policy to require IT management to approve all field personnel's access to production and test environments. Finally, all non-national application development must follow current Postal Service procedures and IT management must approve all existing applications before they are placed in production. Therefore, we are not making any further recommendations at this time.

### Technology Solutions Life Cycle Governance and Compliance Process

The TSLC scorecard<sup>15</sup> is designed to monitor governance of and compliance with the software development process. However, management is not currently using the tool to ensure all software development complies with the Postal Service's TSLC policies and compliance standards. Specifically, we determined that:

- While the scorecard is capable of tracking all seven phases<sup>16</sup> of the TSLC process, management only uses it to track the requirements, SIT, and CAT phases. This occurred because management decided to use the scorecard to monitor key controls for Sarbanes-Oxley (SOX) applications<sup>17</sup> as opposed to monitoring the entire software development process as originally designed.
- The scorecard report lists all applications that do not comply with TSLC policies. However, the IT Compliance Management Office (CMO) does not perform quality reviews or follow-up for non-SOX applications to verify that issues were corrected. For example, we found 14 instances where Business Relationship Management program managers were notified that documents were missing from the TSLC Artifacts Library but did not correct the issues. This issue exists because management has not developed procedures for correcting discrepancies noted on the scorecard report for non-SOX applications.

If the compliance review process is not followed, the IT CMO may not be able to measure compliance with IT policies, identify issues, and pursue corrective actions. In addition, if modifications to applications are not adequately controlled, unauthorized changes to programs, procedures, or data could compromise the integrity of the applications.

<sup>13</sup> Shadow IT development is used to describe systems built and used inside organizations without explicit organizational approval. These systems are deployed by departments other than IT.

<sup>14</sup> Headquarters management reviewed and approved 18 non-national applications to stay on the network because they were needed for business purposes.

<sup>15</sup> The TSLC scorecard is the tool used for the procedural review of key compliance areas. The monthly scorecard documents whether appropriate artifacts have been uploaded for compliance.

<sup>16</sup> See [Table 1](#) for all TSLC phases.

<sup>17</sup> Financial application supporting business processes and IT applications that have a pervasive impact on the IT control environment.

**Management did not maintain  
1,100 of the 3,451 required  
documents for the  
71 applications we sampled.**

### Technology Solutions Life Cycle Application Status Not Accurate

TSLC artifacts administrators are not updating the application status in the TSLC Artifacts Library. We found eight instances where the application status in the TSLC Artifacts Library and Enterprise Information Repository (EIR)<sup>18</sup> did not match. For example, the Payroll Retirement application status was active in the TSLC Artifacts Library, but did not exist in the EIR. This occurred because current Postal Service policy<sup>19</sup> does not designate the responsibility for updating the TSLC Artifacts Library when systems are retired. Application status needs to be accurate and up-to-date to ensure management makes correct decisions about system needs. As a result of our audit, management took corrective action to update the status for four of the applications<sup>20</sup> we identified and are currently reviewing and updating the status for the remaining four.

### Final Development Documentation Is Not Maintained

Final development documentation for systems and applications is not maintained and stored in the TSLC Artifacts Library. We reviewed 71 randomly selected non-SOX applications. Our sample consisted of five SDLC-developed applications<sup>21</sup> and 66 TSLC-developed applications. In addition, we reviewed four judgmentally selected major investment<sup>22</sup> applications that follow the TSLC process.

We found that all of the required artifacts for the five applications developed under the SDLC process were present in the library; however, we identified missing documentation for the 66 TSLC applications and the four major investment applications. See [Appendix B](#) for the results of our review.

In addition to the TSLC process, management selected the BIDS application in our major investment sample to follow the tollgate process.<sup>23</sup> This process requires the PM to upload required documents into the TSLC Artifacts Library within 10 days after conducting the stakeholder meetings; however, we found that one of 30 required documents were not uploaded to the TSLC Artifacts Library within 10 days of the meeting.

These issues occurred because current TSLC policy<sup>24</sup> does not require the PM to upload software development documentation after each phase of the TSLC process is complete. In addition, final tollgate documentation was not uploaded due to management oversight. System documentation is a key element of governance and compliance. Without accurate and completed documentation, programmers cannot accurately maintain the system and reviewers of the system cannot objectively evaluate functions and controls.

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18 The Postal Service database that maintains information for existing applications.

19 System Retirement Process, Section 7, Certify Retirement, updated EIR, November 3, 2014.

20 Accounts Receivables-Oracle, eClearance Direct Mail To Go Link, and Payroll Retirement.

21 We reviewed SDLC documentation for Advanced Facer Cancellar System (AFCS) Automated-ACP, Automated Parcel Bundle Sorter/Image Controller, Combined Input Output Subsystem - C, Computer Forwarding System/Mechanized Terminal, and Software Storage and Transfer Processor - AFCS.

22 The Postal Service made major capital investments of \$5 million or more for these applications and systems. We reviewed the Business Intelligence Data Store (BIDS), CustomerFirst! Replacement, Package Remote Encoding System, and Retail Systems Software (RSS). Although it was added as a major investment application, RSS is the only SOX application listed in our sample.

23 The tollgate process is used when the project involves critical, multi-stakeholder releases across the organization.

24 TSLC Policy, Initiate and Plan Process, March 18, 2014.

# Recommendations

***We recommend management define specific roles and responsibilities for the requirements and testing phases and ensure that all system requirements are documented and tested prior to migration to production; train personnel to test correctly, and revise policies to require quality reviews, update application status, and upload documentation at the completion of each development phase.***

We recommend the acting vice president, Information Technology, direct the manager, Solutions Development, to:

1. Update Technology Solutions Life Cycle policies and processes to define which groups are responsible for the requirements gathering, design, and testing phases.
2. Implement guidance and training for business owners regarding the customer testing process and ensure that testing teams follow Postal Service Handbook AS-805, *Information Security*.

We recommend the acting vice president, Information Technology, and the vice president, Engineering System, direct the managers of Solutions Development and Engineering Software Management, respectively, to:

3. Ensure that all new system requirements and modifications are gathered, analyzed, documented, and thoroughly tested prior to migration to production.

We recommend the acting vice president, Information Technology, direct the manager, Business Relationship Management, and the manager, Information Technology Quality Assurance, to:

4. Update development policies including the Technology Solutions Life Cycle (TSLC) governance and compliance policy to include all software development phases in the monthly governance and compliance review process and update the system retirement process to designate responsibility for updating the application status in the TSLC Artifacts Library.

We recommend the acting vice president, Information Technology, direct the manager, Business Relationship Management, to:

5. Revise policies to require program managers to upload required documentation into the Technology Solutions Life Cycle (TSLC) Artifacts Library at the completion of each phase of the TSLC process.

## Management's Comments

Management agreed with the findings and recommendations in the report and, in subsequent communications, also agreed with the \$4.5 million of monetary impact.

Regarding recommendation 1, management stated they will update TSLC policies and procedures to clarifying roles and responsibilities. Management's target implementation date is December 31, 2015.

Regarding recommendation 2, management stated they will provide TSLC training to development personnel, program management personnel, and customer stakeholders. Management's target implementation date is March 31, 2016.

Regarding recommendations 3, 4, and 5, management stated they will evaluate software development processes in the IT organization and update the TSLC policies accordingly. In addition, management will implement processes and procedures that reflect current development practices and business needs using a risk-based approach. Management also stated they will evaluate and update the retirement process accordingly. Management's target implementation date is September 2016.

See [Appendix C](#) for management's comments, in their entirety.

## Evaluation of Management's Comments

The U.S. Postal Service Office of Inspector General (OIG) considers management's comments responsive to the recommendations and corrective actions should resolve the issues identified in the report.

The OIG considers recommendations 2, 4, and 5 significant, and therefore requires OIG concurrence before closure. Consequently, the OIG requests written confirmation when corrective actions are completed. These recommendations should not be closed in the Postal Service's follow-up tracking system until the OIG provides written confirmation that the recommendations can be closed.

# Appendices

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## Appendix A: Additional Information

### Background

Software development is the process of converting management or business needs into an application. Organizations use these applications to drive innovation and competition, thus spending significant resources developing, acquiring, and maintaining applications that manage critical information.

When applications are properly designed, system development and documentation controls can prevent or disclose the following types of errors:

- Implementation of applications that do not have adequate application controls.
- Development of applications that either do not meet management objectives or do not operate in accordance with original specifications.
- Implementation of applications that have not been adequately tested.
- Implementation of applications that are susceptible to unauthorized modification.

In March 2013, Postal Service IT management selected Agile Scrum as its primary TSLC methodology for all new system development. Agile Scrum is an iterative and incremental development methodology in which requirements and solutions evolve through collaboration between developers and business customers. Agile Scrum enables the Postal Service to manage its operations, optimize the value of the infrastructure, and leverage technology to drive business value. In addition, Agile Scrum:

- Increases customer satisfaction
- Increases the number of projects completed on-time and within budget
- Prioritizes customers' requirements
- Improves project communications
- Improves code quality and decreases defects and re-work
- Timely identifies and escalates issues

[Table 1](#) describes the TSLC phases and the required software development documentation.

**Table 1. TSLC Process**

<b>TSLC Phase</b>	<b>Description</b>	<b>Required Documentation<sup>25</sup></b>
Initiate and Plan	Defines high-level business needs and high-level project plan.	Business Needs Statement (BNS) <sup>26</sup> Tollgate, Change Control Board (CCB) <sup>27</sup>
Requirements	Identifies and documents business requirements to use in developing a technology solution.	Baseline Tollgate, Requirements with Approval and Requirements Traceability Matrix (RTM) <sup>28</sup>
Analysis and Design	Develops the technology design (application, infrastructure, security, etc.) for developing the technology solution.	Finalize Release Tollgate
Build	Includes development of the technology components specified in the design document.	SIT Scripts <sup>29</sup>
SIT	Conducted by the IT test team to validate that the technology solution and its features conform to the requirements and design.	SIT Approvals, <sup>30</sup> SIT Results
CAT	Ensure the technology solution satisfies the documented requirements and is approved by the customer.	CAT Results, CAT Scripts, CAT Approval, <sup>31</sup> Implementation Tollgate
Release Management	Ensures that pre-implementation tasks are defined, change management is followed correctly, and post-implementation steps are executed.	Closeout Tollgate

Source: TSLC Artifacts Library.

All functional areas under the CIO are responsible for development, acquisition, integration, deployment, and maintenance efforts for applications and systems. In addition to this, IT Business Relationship Management is required to store final baseline documents in the TSLC Artifact Library; and the IT Strategy and Compliance group is responsible for developing, auditing, and measuring compliance against TSLC policies, processes, standards, and controls. Finally, Engineering Software Management (ESM) provides policy and procedures to all engineering design organizations for software products fielded by Engineering. ESM validates requirements and test procedures to ensure the quality of software products.

[Table 2](#) describes the SDLC phases and required software development documentation.

<sup>25</sup> Mandatory baseline artifacts that must be uploaded to the TSLC Artifacts Library prior to release into production.

<sup>26</sup> Developed by the business owner (customer) to define the business objectives and value of the application.

<sup>27</sup> Identifies all stakeholders of the technology solution and change control process for all releases.

<sup>28</sup> Documents the origin of a requirement and ensures that all approved business and technical requirements are appropriately tested and implemented.

<sup>29</sup> Step-by-step actions the tester takes during testing of the application.

<sup>30</sup> SIT approvals are obtained from the group responsible for executing and documenting SIT scripts, and validating test results.

<sup>31</sup> CAT scripts are the step-by-step actions taken during customer testing and CAT approvals are obtained from the group responsible for executing and documenting CAT scripts and validating test results.

**Table 2. SDLC Process**

<b>SDLC Phases</b>	<b>Description</b>	<b>Required Documentation<sup>32</sup></b>
Initiate and Plan	Defines the high-level business needs and economics of the program	Decision Analysis Report <sup>33</sup>
Define	Identifies and documents software requirements	RTM Checklist
Design	Develops software design	Software Master Test Plan <sup>34</sup>
Develop	Includes software preparation for testing	Software Modification Order <sup>35</sup> Project Development Environment <sup>36</sup>
Test	Ensures software testing is performed and documented	Software Test Report <sup>37</sup>
Deploy	Initial version of software released to the field	Field Worthiness Evaluation Report <sup>38</sup>
Close Out	Finalizes the development process	Software Integrated Support Specification <sup>39</sup>

Source: *Engineering Systems Process Assets Library and Engineering SDLC Process Training Manual*.

### **Objective, Scope, and Methodology**

Our audit objective was to determine whether the Postal Service’s software development processes are sufficient to manage development risk and reflect best practices. Our audit scope covered applications developed from January 2013 through December 2014. We conducted work at Postal Service Headquarters, the Information Technology Service Center in Raleigh, NC, and Engineering Headquarters in Merrifield, VA.

To accomplish our objective, we reviewed policies and procedures for software development. We reviewed software development documentation to determine whether it was current and reflected best practices. We interviewed key officials to determine the roles and responsibilities for the software development processes. In addition, we selected random and judgmental samples of applications to determine if the mandatory documentation was maintained and stored in the artifacts repositories. Finally, we reviewed documentation to determine whether business needs, requirements, and risks were identified and approved and testing was conducted and documented.

We conducted this performance audit from October 2014 through July 2015, in accordance with generally accepted government auditing standards and included such tests of internal controls as we considered necessary under the circumstances. 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 objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. We discussed our observations and conclusions with management on June 12, 2015 and included their comments where appropriate.

<sup>32</sup> There are 39 required documents for the SDLC process. We only listed a few for each phase.

<sup>33</sup> Explains the background, purpose, and cost/benefit estimates of major operating expense investments.

<sup>34</sup> Identifies tests to perform, test environments, and test roles and responsibilities.

<sup>35</sup> Describes and authorizes the software installation and maintenance release.

<sup>36</sup> Defines programming, testing, and target environments. It also contains change, build, testing, and deployment procedures.

<sup>37</sup> Provides detailed test results and a log of testing.

<sup>38</sup> Used to measure risk of customer dissatisfaction with software release.

<sup>39</sup> Identifies the contractor’s plans for transitioning support of the software to the Postal Service.

We assessed the reliability of software development data by reviewing information stored in the TSLC Artifacts Library, EIR, and Serena Dimensions Change Management. In addition, we interviewed agency officials knowledgeable about the data and process and tested required documents. We determined that the data were sufficiently reliable for the purposes of this report.

#### **Prior Audit Coverage**

The U.S. Postal Service Office of Inspector General (OIG) issued the *Retail Systems Software Application Requirements* report (Report Number IT-MA-15-002, dated March 30, 2015), which found the RSS testing team did not follow the TSLC Agile Scrum process, or adhere to policy requirements for planning and testing the application. Specifically, the team did not develop adequate test scripts and validate test results to ensure all documented requirements were met. Management agreed with our findings and recommendations. We did not claim any monetary impact in this report.

## Appendix B: Documentation Review

**Table 3. TSLC Development Documentation Review**

Required Documentation	Number of Expected TSLC Artifacts	Number of Documents Missing	Number of Existing Documents	Percentage of Documents Missing
<b>Program-Level Artifacts<sup>40</sup></b>				
CCB	70	62	8	89%
EIR Registration and Retirement	70	24	46	34%
Host Diagram <sup>41</sup>	70	44	26	63%
Run Book <sup>42</sup>	70	63	7	90%
Security C and A Documents <sup>43</sup>	70	37	33	53%
System Documentation	70	43	27	61%
Retirement	15	8	7	53%
<b>Project-Level Artifacts<sup>44</sup></b>				
CCB	377	99	278	26%
Requirements with Approval and RTM	377	90	287	24%
SIT Scripts	377	102	275	27%
SIT Approvals	377	104	273	28%
SIT Test Results	377	102	275	27%
CAT Scripts	377	107	269	28%
CAT Approvals	377	107	270	28%
CAT Test Results	377	108	269	29%

Source: TSLC Artifacts Library and OIG.

<sup>40</sup> The initial development documents for an application.

<sup>41</sup> High-level architectural diagram that documents connectivity, data and business flow, and support functions for all information resources.

<sup>42</sup> A written set of procedures for the routine operation of the system.

<sup>43</sup> The required certification and accreditation documentation.

<sup>44</sup> Changes to an application after initial migration to production.

## Appendix C: Management's Comments

Judith A. Adams  
(A) Vice President  
Information Technology



June 23<sup>rd</sup>, 2015

LORI LAU DILLARD  
DIRECTOR, AUDIT OPERATIONS

SUBJECT: Response to Draft Report: Software Development Processes (IT-AR-15-DRAFT)

Overall, Postal Service management agrees with the intent of the Office of Inspector General's (OIG) audit report. Postal Service management recognizes the need to address the issues around proper governance over software development. Postal Service management will holistically evaluate the technology solutions life cycle (TSLC) policies and processes and implement processes and procedures that better reflect current development practices and business needs to address recommendations 3-5.

Recommendation [1]:

Update the Technology Solution Life Cycle policies to define which groups are responsible for the requirement gathering, design, and testing phases.

Management Response/Action Plan:

Management agrees with this recommendation. Business Relationship Management and Solutions Development and Support will coordinate to re-evaluate the TSLC policies and procedures to include language clarifying roles and responsibilities wherever possible.

Target Implementation Date:

December 31, 2015

Responsible Officials:

Manager, Business Relationship Management  
Manager, Solutions Development and Support

Recommendation [2]:

Implement guidance and training for business owners regarding the customer testing process and ensure that testing teams follow Handbook AS-805, *Information Security*.

Management Response/Action Plan:

Management agrees with the recommendation. Business Relationship Management and Solutions Development and Support will identify and deploy a process to deliver a TSLC deep-dive training to:

- Development Personnel
- Program Management Personnel
- Customer Stakeholders

Target Implementation Date:

March 31, 2016

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Judith A. Adams  
(A) Vice President  
Information Technology

Responsible Officials:

Manager, Business Relationship Management  
Manager, Solutions Development and Support

Recommendation [3]:

Ensure that all new system requirements and modifications are gathered, analyzed, documented, and thoroughly tested prior to migration to production.

Recommendation [4]:

Update development policies including TSLC governance and compliance policy to:

- 1) Include all software development phases in the monthly governance and compliance review process, and
- 2) Update the system retirement process to designate responsibilities for updating the application status in the TSLC Artifact Library

Recommendation [5]:

Revise policies to require PMs to upload required documentation into the TSLC Artifacts Library at the completion of each phase of the TSLC process.

Management Response/Action Plan:

Management will perform a holistic evaluation of the software development practices within the IT organization and update Postal Service technology solution life cycle policies and processes accordingly. Management will review the life cycle process to better reflect development practices and current business needs using a risk-based approach.

With regards to updating the system retirement process to designate responsibilities for updating the application status in the TSLC Artifact Library within recommendation 4, management agrees and will evaluate and update the retirement process accordingly.

Target Implementation Date:

September, 2016

Responsible Officials:

Manager, Business Relationship Management  
Manager, Solutions Development and Support



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cc: *Sally K. Haring, Manager, Corporate Audit Response Management*

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