



July 27, 2010

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MANAGER, REGULATORY REPORTING AND COST ANALYSIS

SUBJECT: Audit Report – Cost and Revenue Analysis Reporting Model
(Report Number CRR-AR-10-003)

This report presents the results of our self-initiated audit of the Cost and Revenue Analysis (CRA) reporting model (Project Number 09RG025CRR000). Our objective was to evaluate the controls over the development and maintenance of CRA reports.

The Postal Accountability and Enhancement Act of 2006 (the Postal Act of 2006) requires the U.S. Postal Service Office of Inspector General (OIG) to regularly audit the data collection systems and procedures the Postal Service uses to prepare its reports analyzing costs, revenue, rates, and quality of service for the Postal Regulatory Commission (PRC). This audit addresses strategic and financial risk. See [Appendix A](#) for additional information about this audit.

The Postal Service annually prepares the CRA report to determine whether it complied with the statutory requirement that each class or type of mail service bear the direct and indirect costs attributable to that class or service. The Cost Attribution group under Regulatory Reporting and Cost Analysis prepares the CRA report, which is appended to the Annual Compliance Report (ACR) provided to the PRC.

The Postal Service uses the CRA model, which consists of a set of Excel workbooks with embedded formulas and programming code that perform cost compilations and other calculations, to prepare the CRA report. The model uses cost information from the agency's accounting system and cost allocation ratios derived from various operational and statistical information sources to prepare the CRA report. The cost, operational, and statistical data from various sources, including accounting systems and subsystems (such as the In-Office Cost System (IOCS) and the Revenue, Pieces, and Weight (RPW) Report) is input into the CRA model. The final CRA report is prepared by executing the programs within the CRA model workbooks and completing certain quality control checks.

Conclusion

Controls over the development and maintenance of CRA reports were generally adequate. Specifically, supporting workbooks, formulas, and computer programming code incorporated into the CRA model function as intended. The structure of the CRA model enables verification of data from the source systems against the final report. In addition, Cost Attribution personnel validate computations and cost allocations to ensure accuracy and maintain adequate supporting documentation.

However, the Postal Service needs to establish proper access controls for its [REDACTED] [REDACTED] to limit file access to personnel who prepare and maintain CRA reports. In addition, the Postal Service can further enhance controls by improving CRA process documentation and following best practices in maintaining computer programming documentation for the CRA model.

Access Controls

Access controls are inadequate to safeguard the CRA model and relevant workbooks. [REDACTED], 28 employees have unrestricted read and write privileges to CRA supporting files [REDACTED] while only 15 users require access to these files. Personnel from the Cost Attribution group stated that they use [REDACTED] for convenience rather than segregating and limiting access to the CRA files.

Implementing an appropriate control process over CRA model workbooks is critical [REDACTED], exposing them to an increased risk of error. According to management, establishing password controls over individual workbooks would reduce the efficiency of preparing the CRA report. However, password controls could be implemented over the programming code within each workbook and administrators could maintain workbooks separately [REDACTED]. Strengthening access controls will enhance the security of these files and assist in ensuring that the over \$70 billion in costs reported in the CRA model are accurate.

We recommend the manager, Regulatory Reporting and Cost Analysis, direct the manager, Cost Attribution, to:

1. Incorporate access controls such as password protection in the modules containing computer programming code.
2. Coordinate with Information Technology to implement controls to limit access to the Cost and Revenue Analysis model and related workbooks to authorized users.

Program Documentation

The Postal Service has not fully documented the process used to prepare the CRA report. The Postal Service relies on various documentation including the Summary Description, ACR Schedule, programmers' manuals, and procedures for CRA report preparation. However, the various documents do not always complement each other or they contain obscure descriptions regarding the actual calculations that are performed. For example, both the fiscal year (FY) 2008 Summary Description and a control file¹ listed equipment categories for allocating operating equipment maintenance expense. However, the two lists contained different equipment categories. While we did verify that the files contained the correct equipment category, these inconsistencies could lead to future errors. During the audit, management took corrective action and updated the FY 2009 Summary Description. Although necessary changes were made to the program code, the programmers' manuals have not been updated since 2006 to ensure that VBA program code conforms to the cost allocation principles described in the *Summary Description of USPS Development of Costs by Segments and Components* prepared annually for the PRC.

Management believes that the milestones developed annually for the CRA process ensure timely filing of the report to the PRC and that further documentation is not necessary. However, incomplete or unclear procedures could lead to errors in the CRA report and deter the timely detection of errors.

We recommend the manager, Regulatory Reporting and Cost Analysis, direct the manager, Cost Attribution, to:

3. Update the programmer's manuals to include calculation logic that is consistent with established business rules and programming codes.

Programming Best Practices

We reviewed 11 calculation routines within the CRA model and a sample of components, distribution keys, and calculated values. The CRA model calculations worked as intended and the documentation provided for the model contained relevant data; however, we noted that the VBA programming code does not always follow best practices for optimal performance with regard to:

- Using the *option explicit* statement² to require explicit variable declarations.³ VBA allows variables to be declared either explicitly (generally at the beginning of the script or procedure), or implicitly (as needed within the program). The VBA programs

¹ A workbook titled *FY 08.cntl.xls*, which is part of the CRA model.

² The *option explicit* statement requires that all variables be declared using a Dimension (Dim) statement. The VBA program compiler will generate an error when it encounters an undeclared or misspelled variable and the code will not execute until the error is corrected.

³ A variable stores temporary information that is used for execution within the procedure, module or workbook.

in the CRA model do not contain the *option explicit* statement that requires the specific naming of variables in the script or individual procedure.

Explicit variable declaration is considered best practice because the developer must define each variable before using them in code. The VBA program compiler will generate an error when it encounters an undeclared variable and the code will not execute until the error is corrected.

Use of implicit declarations can lead to unintended results if variables are misspelled. For example, if a variable named "iClass" is used in one portion of the code, use of "iClas=25" later in the code will result in creation of a new variable "iClas" being assigned a value equal to 25, rather than this value being assigned to "iClass" as intended. This type of programming error can be difficult to identify (but easily corrected once identified) because program execution is not aborted. Using the *option explicit* statement would prevent the use of misspelled variable names because these names must be declared in a Dimension statement.

- Specifying variable types in subroutines. The subroutine declarations in the VBA program code do not identify the type of each variable used within the subroutine. In the absence of variable type information, the VBA environment would consider all variables as a generic *variant* type which can be any type of data element. For example, the subroutines in the module for allocating costs use variables without type declarations to represent different data elements such as variability factors, component numbers, total costs, and spreadsheet names. Use of *variants* requires the VBA compiler to add program code to test which type of data is actually stored in the variable, adding overhead to the program.

Best practices in computer programming require that variables types be correctly declared in the subroutine. Incorporating the proper type declarations in subroutines will help program portability to newer versions and lead to easier code maintenance and faster program execution.

- Retaining obsolete code. Various workbooks contain obsolete VBA code that was incorporated into the program during the development stage but this code has not been removed from the production routines. For example, all 11 calculation routines we reviewed contained "commented out" code that was no longer necessary due to programming elsewhere in the calculation routines. Although calculations may not be affected by obsolete code, deleting it can simplify code maintenance and prevent its inadvertent reactivation. In addition, obsolete code could cause confusion for new users.

Postal Service personnel and the contractors who developed the code stated they believe the current program code produces the results prescribed by the PRC for CRA reporting and that some obsolete code which has been disabled might be needed in the

future. However, implementing best practices in programming will help ensure program integrity and robustness, future compatibility, and efficient program maintenance.

We recommend the manager, Regulatory Reporting and Cost Analysis, direct the manager, Cost Attribution, to:

4. Conduct a source code review and incorporate best practice methodologies for code development and deletion of disabled obsolete code.

Management's Comments

Management concurred with our findings and recommendations. In response to recommendation 1, management stated the manager, Cost Attribution, will investigate adding password protection to the VBA code in the CRA spreadsheets, but added that there are mitigating controls in place that provide a very high level of protection. In a subsequent correspondence, management stated they would complete this review by August 31, 2010.

In response to recommendation 2, management stated they deployed a dedicated server to store the CRA model and related workbooks. After reviewing workflows and access requirements, management granted 16 authorized users write access to these resources.

In response to recommendation 3, management stated that, while updating the CRA programmer manual for routines added or deleted since 2006 would be useful, budgetary constraints make the updating of manuals not required by the Postal Regulatory Commission a low priority. Management also stated that it would first be necessary to implement any programming changes that they determine necessary following a source code review and incorporation of best practices.

In response to recommendation 4, management stated that, while they agree with the intent of the recommendation, a thorough source code review and incorporation of best practices methodologies would require extensive contractor hours and would not be the most productive use of limited funding. Further, retention of some "obsolete" code might be useful in future development work. Management has already deleted some disabled code in connection with ongoing coding work and will continue similar "housecleaning" efforts whenever practical so they can implement these changes in an efficient manner. See [Appendix B](#) for management's comments in their entirety.

Evaluation of Management's Comments

The U.S. Postal Service OIG considers management's comments responsive to the recommendations in the report. Regarding recommendation 1, we recognize that there were compensating controls in place; however, we do not believe these controls were adequate since a dedicated server with access restrictions was not in place at the time

of our audit. Management stated, in response to recommendation 2, that a dedicated server with appropriate access controls is now in place. In addition, management reduced the number of users with write access to CRA spreadsheets placed on the shared network drive to 16 users and agreed to explore the feasibility of password protecting the VBA code. Therefore, we consider the actions taken to be responsive to recommendations 1 and 2.

Regarding recommendations 3 and 4, while we understand that there are financial and resource restrictions, we believe that fully documenting the CRA process and incorporating best practice methodologies for code development and deletion of disabled obsolete code as resources permit will further assist in the accurate and timely completion of the CRA report.

The OIG considers recommendations 1 and 2 significant, and therefore requires OIG concurrence before closure. Consequently, the OIG requests written confirmation when corrective actions are completed. The management response to recommendation 2 is sufficient to close that recommendation; recommendation 1 should not be closed in the Postal Service's follow-up tracking system until the OIG provides written confirmation that the recommendation can be closed.

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact Paul Kuennen, director, Cost, Revenue, and Rates, or me at 703-248-2100.

E-Signed by Darrell E. Benjamin, Jr. 
VERIFY authenticity with ApproveIt 

Darrell E. Benjamin, Jr.
Deputy Assistant Inspector General
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Attachments

cc: Joseph Corbett
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APPENDIX A: ADDITIONAL INFORMATION

BACKGROUND

The Postal Act of 2006 requires that each class or type of mail service bear the direct and indirect costs of that class or service. The Postal Service annually prepares the CRA report to help determine that it is meeting this legal requirement. The Postal Service prepares cost and revenue information by product using methods approved by the PRC.

The Postal Service prepares public and non-public versions of the CRA report. While the public version contains detailed cost information for market-dominant products and limited information regarding competitive products, the non-public version includes detailed cost information relating to competitive products.

The Postal Service's accounting system contains the basic data required for preparing the CRA report. However, the accounting system generally does not accumulate financial data by categories of mail. Apportionment factors, derived from various postal operational and statistical information sources, are required for developing data for the CRA report. Some of these sources are dedicated to this purpose and involve extensive statistical sampling of Postal Service activity during the year. The Postal Service compares and scales the calculated amounts to actual data in the postal system of accounts, as appropriate.

The Postal Service uses a model based on Microsoft Excel to develop the CRA report. Over 30 workbooks and supporting documents are involved in the process of importing data, calculating the desired output, and generating various workbooks and reports including the CRA report. The CRA model consists of interlinked worksheets with approximately 200,000 formulas and 13,000 lines of VBA programming code for performing calculations and cost allocations. Annually, data from various sources, such as IOCS, Rural Carrier Cost System, the RPW, and the trial balance are imported manually and automatically into data workbooks. Once all relevant data are populated, they are uploaded into the CRA model for the calculation and generation of the CRA report.

The Cost Attribution group in Regulatory Reporting and Analysis is responsible for preparing the CRA report and maintaining the CRA model. The Forecasting group in Finance uses the CRA model for quantitative analysis and forecasting purposes.

OBJECTIVE, SCOPE, AND METHODOLOGY

Our objective was to evaluate controls over the development and maintenance of the CRA reports. To accomplish our objective, we reviewed available policies and procedures. We interviewed personnel in the Cost Attribution office and the PRC. We also reviewed worksheets and programmers' manuals provided by the Postal Service to

gain an understanding of business rules and determine the risks and potential deficiencies of controls over the development and maintenance of the CRA reporting modules. We created an inventory of all formulas used in the CRA preparation process. From this inventory, we evaluated a statistical sample of formulas included in key worksheets within the model and reviewed them for accuracy and completeness. We traced selected components' corresponding figures to the the cited source.

We also used a contractor to determine whether the VBA programs used in the CRA model adequately function to produce expected result in accordance with Summary Description and other requirements documents. We evaluated the contractor's findings to reach our conclusions regarding the VBA program.

We conducted this performance audit from July 2009 through July 2010⁴ 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 did not test system production data but instead focused on the reliability of the VBA code and workbook formulas to produce expected results. We believe our tests of the reliability of spreadsheet formulas and VBA code provide a reasonable basis for our findings and conclusions based on our audit objective. We discussed our observations and conclusions with management officials on June 3, 2010, and included their comments where appropriate.

PRIOR AUDIT COVERAGE

We did not identify any prior audits of the CRA model.

⁴ We suspended this project from December 30, 2009 through May 24, 2010.

APPENDIX B: MANAGEMENT'S COMMENTS

FINANCE



July 21, 2010

LUCINE M. WILLIS
DIRECTOR, AUDIT OPERATIONSSUBJECT: Transmittal of Draft Audit Report – Cost and Revenue Analysis
Reporting Model (Report Number CRR-AR-10-DRAFT)

This provides management's response to the subject audit report. We appreciate the opportunity to review and provide comments.

The Postal Service agrees with the audit team's findings that "[t]he Postal Service needs to establish proper access controls for its shared network drive...to limit file access to personnel who prepare and maintain CRA reports." The Postal Service also agrees in principal with the audit team's findings that "the Postal Service can further enhance controls by improving CRA process documentation...", although we question whether a stand-alone documentation effort would return sufficient value given our limited contracting budget.

On the other hand, the Postal Service does not believe there is any value to be gained by adding password protection to the Visual Basic programming code of the CRA spreadsheets. We address each recommendation below.

The audit team recommended the manager, Regulatory Reporting and Cost Analysis, direct the manager, Cost Attribution, to:

Recommendation 1

Incorporate access controls such as password protection in the modules containing computer programming code.

Response

I will direct the manager, Cost Attribution, to investigate adding password protection to the VBA code in the CRA spreadsheets. However, I wish to reiterate several facts we presented in preliminary meetings and responses: (1) the code in question is only utilized for report generation; (2) it is maintained by at most two programmers; (3) the working versions of the CRA spreadsheets reside on the Cost Attribution analyst's password-protected hard drive; (4) the "official" versions are filed with the PRC as part of the Annual Compliance Report; and (5) the archival versions reside in a shared subdirectory that is now accessible only by those who have direct responsibility for CRA model programs and inputs. We agree that access control is important as suggested in the Recommendation. In light of the circumstances described above, we believe that there is indeed a very high level of protection.

Recommendation 2

Coordinate with Information Technology to implement controls to limit access to the Cost and Revenue Analysis model and related workbooks to authorized users.

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Response

At the end of June, a dedicated server was made available to the Regulatory Reporting and Cost Analysis group, giving us an enhanced degree of control over access to high-level subdirectories. Following a meeting of stakeholders to discuss data flows and requirements, we determined that write access to the Cost and Revenue Analysis model and related workbooks should be granted to 16 authorized users. These access restrictions are now in place.

Recommendation 3

Update the programmer's manuals to include calculation logic that is consistent with established business rules and programming codes.

Response

I agree that it would be useful to update the CRA programmer manual to include routines added or deleted since 2006. Once again, however, I must note that our budgetary circumstances force us to be highly selective in allocating our contractor funding, and the updating of manuals not required by Postal Regulatory Commission rules would necessarily be a low-priority undertaking. As for including "calculation logic that is consistent with established business rules," it would first be necessary to implement any programming changes that are determined to be necessary following a source code review and incorporation of best practice methodologies, as discussed under Recommendation 4, below.

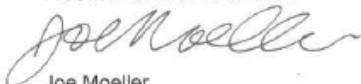
Recommendation 4

Conduct a source code review and incorporate best practice methodologies for code development and deletion of disabled obsolete code.

Response

As was discussed during the course of this audit, a thorough source code review and incorporation of best practices methodologies conducted outside of our normal course of business would require extensive contractor hours and would not be the most productive use of our limited funding. Moreover, I do not believe that the recommended changes would significantly improve the security, execution speed, or accuracy of the CRA programs, which are the attributes of greatest importance. As we also discussed during the course of the audit, not all disabled "obsolete" code should necessarily be deleted, as our programmers have indicated that retaining at least some of this code would be useful to them in future development work. Nevertheless, we agree that "housecleaning" efforts are in order, and in fact some disabled code has already been deleted in connection with coding work that was being performed within various program modules. We will, consistent with this recommendation, continue similar "housecleaning" efforts whenever practical so that these changes are implemented in an efficient manner.

This report does not contain information that may be exempt from disclosure under the Freedom of Information Act.



Joe Moeller
 Manager, Regulatory Reporting and Cost Analysis

cc: Joe Corbett
 Jamie Gallagher
 Jeff Colvin