



Memorandum from the Office of the Inspector General

September 4, 2014

Diane T. Wear, WT 4B-K

REQUEST FOR FINAL ACTION – AUDIT 2013-15106 – REVENUE BILLING INVOICE PREPARATION

Attached is the subject final report for your review and final action. Your written comments, which addressed your management decision and actions planned or taken, have been included in the report. Additionally, based on the actions taken on Recommendations 1 and 3, no further action is necessary, and we have closed these recommendations. Please notify us when final action is complete on Recommendations 2 and 4. In accordance with the Inspector General Act of 1978, as amended, the Office of the Inspector General is required to report to Congress semiannually regarding audits that remain unresolved after 6 months from the date of report issuance.

Information contained in this report may be subject to public disclosure. Please advise us of any sensitive information in this report that you recommend be withheld.

If you have any questions or wish to discuss our findings, please contact Melissa M. Neusel, Audit Manager, at (865) 633-7357 or Rick C. Underwood, Director, Corporate Governance and Finance Audits, at (423) 785-4824. We appreciate the courtesy and cooperation received from your staff during the audit.

David P. Wheeler
Deputy Assistant Inspector General
(Audits)
ET 3C-K

MMN:BSC
Attachment
cc: See page 2

Diane T. Wear
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September 4, 2014

cc (Attachment):

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OIG File No. 2013-15106



Office of the Inspector General

Audit Report

To the Vice President and
Controller, Corporate
Accounting

REVENUE BILLING INVOICE PREPARATION

Audit Team
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Michael P. Anderson
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Audit 2013-15106
September 4, 2014

ABBREVIATIONS

BDI	Billing Data Interchange
FY	Fiscal Year
FCA	Fuel Cost Adjustment
IEE	Itron Enterprise Edition
IT	Information Technology
kW	Kilowatt
kWh	Kilowatt Hours
LPC	Local Power Company
MDM	Meter Data Management
OIG	Office of the Inspector General
SOX	Sarbanes-Oxley
SPP	Standard Programs and Processes
TVA	Tennessee Valley Authority

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- A. OBJECTIVES, SCOPE, AND METHODOLOGY
- B. LETTER DATED AUGUST 28, 2014, FROM DIANE T. WEAR TO DAVID P. WHEELER



Audit 2013-15106 – Revenue Billing Invoice Preparation

EXECUTIVE SUMMARY

Why the OIG Did This Audit

The Tennessee Valley Authority (TVA) sells power at wholesale rates to 155 local power companies (LPC), who then resell the power to their end-use customers at retail rates. TVA's total electricity sales were \$10.8 billion in fiscal year 2013, and revenue from the LPCs was \$9.4 billion or 87 percent.

TVA bills the LPCs based on meter readings for demand (kilowatt [kW]) and energy (kilowatt hours [kWh]) amounts delivered. The majority of the total amount billed on each LPC invoice is demand and energy charges, which consists of two components: (1) monthly kW and kWh totals comprised of daily meter readings multiplied by (2) rates for the various classifications (e.g., residential and commercial/industrial). TVA utilizes the software package Oracle Utilities, also referred to as Lodestar, to produce the wholesale invoices.

The Office of the Inspector General (OIG) included a review of the Revenue Billing invoice preparation process on its annual audit plan because of the significance of LPCs revenue to TVA. We audited the Revenue Billing invoice preparation process for the period April 1, 2011, through July 31, 2013, to determine if:

1. Wholesale invoices were calculated correctly.
2. Controls to prevent/detect invoice errors were adequate.
3. Oracle Utilities had appropriate/adequate information technology (IT) general and application level controls.

Our audit focused on the Revenue Billing and Power Billing departments' roles and responsibilities in the revenue billing process. The Power Billing department is responsible for the validity of the demand and energy readings in Oracle Utilities. The Revenue Billing department is responsible for the accuracy and completeness of amounts invoiced.



Audit 2013-15106 – Revenue Billing Invoice Preparation

EXECUTIVE SUMMARY

What the OIG Found

Our audit of TVA's Revenue Billing invoice preparation process for LPCs during the period April 1, 2011, through July 31, 2013, found:

1. Wholesale invoices were calculated correctly.
2. Controls to prevent/detect invoice errors were adequate.
3. Oracle Utilities had appropriate/adequate IT general and application level controls.

However, we identified some minor issues where changes could strengthen and/or improve the revenue billing process and may decrease the likelihood of errors or adjustments.

Per TVA personnel, beginning in January 2013 monthly meetings between the various departments involved with the invoicing process have been conducted to review adjustments and the higher risk areas to improve the process. As of July 31, 2013, the number of adjustments made by Power Billing and Revenue Billing had decreased 48 percent from fiscal year 2012.

What the OIG Recommends

We recommend TVA's Vice President and Controller, Corporate Accounting, and the Senior Vice President, Transmission, coordinate as appropriate to address the following recommendations:

1. Maintain e-mail approvals that document the rate change control was performed, as required for Sarbanes-Oxley (SOX) testing, either on the share drive with appropriate restricted access or hardcopy.

TVA Management's Comments – TVA management agreed to maintain e-mail approvals on the Revenue share drive that documents the rate change control was performed. E-mail documentation was traditionally stored in this manner for wholesale rate changes and, as of March 2013, the monthly rate change e-mails are stored in this manner as well. (See Appendix B for management's complete response.)

Auditor's Response – The OIG concurs with TVA management's response and no further action is necessary.



Audit 2013-15106 – Revenue Billing Invoice Preparation

EXECUTIVE SUMMARY

2. Periodically review Power Billing's controls to determine if they address atypical situations and/or could be strengthened to increase prevention or detection of errors and reduce adjustments.

TVA Management's Comments –TVA management stated the Meter to Cash team that meets on a monthly basis discusses each of the prior month and pending adjustments and looks at the root cause of each to determine if the controls in place are working properly or need to be modified. Power Billing and Revenue's controls are being evaluated and strengthened when needed through this team effort. Additionally, the Power Billing group has internal team meetings monthly to discuss and brainstorm around any metering issues that have come up in the past month. Beginning with the roll forward testing period in October 2014, all SOX controls for Revenue and Power Billing have moved to a management testing model conducted by the Senior Program Manager, Revenue Quality. This will ensure that each control for both groups is being monitored internally and updated or revised as needed. (See Appendix B for management's complete response.)

Auditor's Response – The OIG acknowledges and concurs the monthly Meter to Cash meetings are beneficial; however, this is a reactive control because issues are addressed only after they have occurred. The OIG concurs with TVA management's plans for implementing the management testing model for the SOX controls by the Senior Program Manager, Revenue Quality, where each control is monitored and updated or revised as needed.

3. Implement automated controls requiring appropriate approvals for adjustments based on established threshold amounts.

TVA Management's Comments – TVA management stated that as of May 2014, TVA has automated invoice adjustments associated with the revenue for kW and kWh. The automation should alleviate the concerns around the tiered review process since the majority of adjustments (dollar and volume related) will now be handled systematically. The current tiered review process will stay in place for any one-off adjustments that have to be made manually. (See Appendix B for management's complete response.)

Auditor's Response – The OIG concurs with TVA management's actions and no further action is necessary.



Audit 2013-15106 – Revenue Billing Invoice Preparation

EXECUTIVE SUMMARY

We recommend TVA's Vice President and Controller, Corporate Accounting, and the Vice President, Pricing and Contracts, coordinate as appropriate, and:

4. Automate the transmission of rate changes to Oracle Utilities from source systems. If automating transmission of rate changes is not considered cost beneficial, implement one common set of rate classification descriptions to increase the efficiency of updating the rates as well as reduce the risk of manual input errors.

TVA Management's Comments – TVA management agreed to move forward with the automation of rate changes to Lodestar from the source system. Automation of this process was being explored prior to the OIG audit, and Revenue Billing has participated in a working discussion with the IT department on how to attain this goal. The new process should be implemented no later than December 2014. (See Appendix B for management's complete response.)

Auditor's Response – The OIG concurs with TVA management's planned actions.

BACKGROUND

The Tennessee Valley Authority (TVA) is primarily a wholesaler of power. TVA sells power to distributors (i.e., local power companies [LPC]) who then resell the power to their end-use customers at retail rates. TVA had wholesale power contracts with 155 LPCs as of September 30, 2013. TVA's total electricity sales were \$10.8 billion during fiscal year (FY) 2013, and revenue from the LPCs was \$9.4 billion, or 87 percent. The remaining 13 percent came from TVA's sales of power to other entities (e.g., directly served customers and federal agencies).

TVA bills LPCs based on meter readings for demand (kilowatt [kW]) and energy (kilowatt hours [kWh]) amounts delivered to the LPCs. The majority of the total amount billed on each LPC invoice is demand and energy charges, which consists of two components: (1) monthly kW and kWh comprised of daily meter readings multiplied by (2) rates for the various classifications (e.g., residential and commercial/industrial).

To produce the wholesale invoices, TVA utilizes the software package Oracle Utilities, also referred to as Lodestar. The revenue billing invoice process begins with kW and kWh meter readings being imported into Oracle Utilities where wholesale rates are applied to the kW and kWh amounts along with the calculation of charges and credits to generate the wholesale invoices and ends when the LPCs are electronically notified the invoice has been generated. In addition to the wholesale invoices, Oracle Utilities generates Power Billing Summary Reports, which consists of the numerous kW and kWh readings collected throughout the month. Oracle Utilities also creates the respective entries that are input into TVA's Enterprise Financial Management System (general ledger). Oracle Utilities is considered an in-scope application for Sarbanes-Oxley (SOX) compliance, which causes it to be tested on a yearly basis for various information technology (IT) general controls.

Several groups within TVA are tasked with ensuring the monthly invoices are complete and issued in a timely and accurate manner, including Revenue Billing, Power Billing, Pricing and Contracts, Metering Services, Customer Resources, and Transmission. Our audit focused on the Revenue Billing and Power Billing departments' roles and responsibilities in the revenue billing process. The Power Billing department is responsible for identifying potential issues in the daily meter data imported into Oracle Utilities and creating the Power Billing Summary Reports (analysis and validity of the demand and energy readings). The Revenue Billing department is responsible for ensuring the various rates are correct within Oracle Utilities and that invoices are generated for all customers from Oracle Utilities on a timely basis (accuracy and completeness of amounts invoiced).

During our audit TVA reorganized and the Power Billing and Revenue Billing departments, which were under one manager in the Financial Services organization, were separated into two organizations. Power Billing is now part of

the Right-of-Way and Meter Management organization, under the Transmission division. Revenue Billing is now called “Revenue” and is part of the Corporate Accounting organization under the Financial Services division; however, we refer to this department as “Revenue Billing” in this report.

OBJECTIVES, SCOPE, AND METHODOLOGY

The Office of the Inspector General (OIG) included a review of the Revenue Billing invoice preparation process on its annual audit plan because of the significance of LPCs revenue to TVA. We audited Revenue Billing’s invoice preparation for the period April 1, 2011, through July 31, 2013, to determine if:

1. Wholesale invoices to LPCs were calculated correctly.
2. Controls to prevent/detect invoice errors were adequate.
3. Oracle Utilities had appropriate/adequate IT general controls.

Our scope included verifying certain rate components and calculations for a random sample of 20 out of 4,340 wholesale invoices billed to 19 of the 155 LPCs during the audit period. We also obtained the invoice adjustment file for the audit period and tested a judgmental sample of 20 out of 209 data records that were the responsibility of the Revenue Billing and Power Billing departments. Our scope did not include testing the accuracy of the demand and energy meter readings imported into Oracle Utilities.

We also reviewed the IT general and application level controls associated with the invoice preparation process except for controls related to System Planning/Risk Assessment. These controls were reviewed by the OIG in Audit 2014-15059, Federal Information Security Management Act, which identified issues TVA management has indicated they will be addressing. A complete discussion of our audit objectives, scope, and methodology are included in Appendix A.

FINDINGS

Our audit of TVA’s Revenue Billing invoice preparation process for LPCs during the period April 1, 2011 through July 31, 2013 found:

1. Wholesale invoices were calculated correctly.
2. Controls to prevent/detect invoice errors were adequate.
3. Oracle Utilities had appropriate/adequate IT general and application level controls.

We identified some minor issues where we believe changes could strengthen and/or improve the revenue billing process and may decrease the likelihood of

errors or adjustments. The following provides a detailed discussion of our findings.

WHOLESALE INVOICES CALCULATED CORRECTLY

To obtain a better understanding of the revenue billing process as well as the business controls identified by management, we obtained the SOX controls and results of TVA's SOX testing. To determine if LPC wholesale invoices were calculated correctly, we tested a sample of 20 invoices billed to LPCs during the audit period. We found all invoices reviewed were calculated correctly; however, we identified minor issues where changes could strengthen the revenue billing process. Some of these issues were discussed with TVA Management; others are discussed in more detail below. Specifically, we found:

- The SOX business controls over the invoice preparation process appeared to be properly designed to detect and prevent errors and help ensure the wholesale invoices were calculated correctly. However, except for testing one specific SOX control, we relied on our sample testing to identify controls that were not functioning properly.
- Demand and energy rates tested in our sample were accurate, indicating the related controls functioned properly; however, our testing of the SOX control found required e-mail approvals could not be located for 8 of 18 rate changes. Also, we found the "standard product" rates are manually updated in Oracle Utilities.

Credits and other charges tested in our sample were accurate and calculated correctly, indicating the related controls functioned properly. Details of testing performed and our results follow.

SOX Business Controls Appear Adequate

TVA's SOX group provided a listing of 24 business controls applicable to the wholesale invoice billing process during the audit period. We noted there were 15 controls identified by TVA as "key" in FY2013, and the status of 3 of these controls was changed to being identified as a "key" control during the audit period because of noted deficiencies. However, there were no outstanding deficiencies associated with the 24 SOX controls as of our report date.

Based on our understanding of the invoice preparation process and controls, it appears the SOX business controls were designed to detect and prevent errors and ensure the wholesale invoices were calculated correctly. However, except for testing the specific SOX control for updating rate changes (discussed below), we relied on our sample testing of invoice accuracy and adjustments to identify controls that were not functioning properly.

Tested LPC Wholesale Demand and Energy Rates Accurate

TVA provides wholesale service to the 155 LPCs under three wholesale rate designs, referred to as “standard products” (i.e., Time of Use, Modified Time of Use, and Seasonal Demand and Energy), which consisted of 142 different kW and 238 different kWh rates during the audit period. “Standard product” charges are calculated by multiplying the total kW and kWh amounts used during the month by the appropriate kW or kWh rate. In addition, TVA has other products referred to as “price feed products.” The kW rates for these products are based off of the Transmission Service Guidelines and the kWh rates are based off of hourly prices fed into Oracle Utilities. We randomly selected a sample of 20 wholesale invoices out of the population of 4,340 invoices (0.5 percent). We attempted to verify and/or recalculate all kW and kWh rates in our sample which contained:

- 82 different kW rates, consisting of:
 - 78 “standard product” rates.
 - 4 Start-up and Testing Power “price feed product” rates.
- 169 different kWh rate components, consisting of:
 - 132 “standard product” rates.
 - 4 Start-up and Testing Power “price feed product” rates.
 - 33 fuel rates associated with energy.
- 16 different fuel cost adjustment (FCA) rates.

All demand and energy rates as well as the FCA rates on invoices tested were accurate.

While no errors were noted in the rates for the invoices tested, we did note the Program Manager of Revenue Billing must manually convert and upload new rate information received from Pricing and Contracts to Oracle Utilities annually. Pricing and Contracts uses a different naming convention for the “standard products” than the naming convention Oracle Utilities uses to generate the wholesale invoices.

After the new rates have been uploaded, the Program Manager performs a final review of the rates in the system and submits an e-mail approval back to the manager. We tested this manual SOX control by requesting copies of the e-mail approvals for the 2 base rate changes¹ and the 16 monthly FCA rates applicable to our sample of 20 invoices. Revenue Billing provided e-mail approvals for the 2 base rate changes and 8 of the 16 monthly FCAs. According to Revenue Billing personnel, the 8 e-mail approvals could not be located because the person, who was no longer at TVA, did not keep the e-mails on the same share drive as the other e-mail approvals.

¹ The base rate changes occurred in April 2011 (when TVA switched from “end-use” billing to “wholesale” billing) and October 2011 (the adjustment for FY2012).

Tested LPC Wholesale Credits and Nonenergy/Nondemand Charges Accurate

To verify the credits and charges other than demand or energy on the 20 sample invoices, we obtained supporting documentation as necessary and recalculated the amounts billed. Our testing results showed credits and charges other than demand and energy in our sample were accurate and calculated correctly, indicating the related controls functioned properly.

CONTROLS TO PREVENT/DETECT LPC WHOLESALE INVOICE ERRORS ADEQUATE

To further determine if the controls to prevent and/or detect errors in the LPCs wholesale invoices were adequate, we tested a sample of 20 data records, which consisted of 48 adjustments, and analyzed the total number of adjustments made by Revenue Billing and Power Billing during the audit period.

Adjustments Made Accurately, but Strengthening Controls Could Decrease Number of Adjustments

We obtained the adjustment file for the audit period which contained 209 data records within our audit scope. Each of the data records represented one or more adjustments associated with one or more identified errors. We selected a random sample of 20 out of the 209 data records (10 percent) consisting of 6 Revenue Billing data records and 14 Power Billing data records with 48 total adjustments. We tested the sample and reviewed the SOX testing results for the applicable controls to determine if controls to prevent and/or detect adjustments were adequate.

We found for 15 of the 20 sampled data records, which consisted of 20 adjustments, controls were adequate and/or TVA proactively took action to strengthen/improve the control that allowed an exception to occur. For these 15 data records, we believe no additional actions by TVA are necessary.

For the remaining 5 sampled data records, which consisted of 28 adjustments, the errors that led to these adjustments are not typical; therefore, the existing controls were not designed to address these types of items. Controls should be proactively reviewed on a periodic basis to determine if they address atypical situations and if they could be strengthened to increase prevention or detection of errors and reduce adjustments.

Number of Adjustments During the Audit Period Decreased

Our analysis of the 209 data records, which consisted of 551 adjustments made during the audit period attributable to Revenue Billing and Power Billing, found fewer adjustments were made during the 10 months of FY2013 than each of the previous two FY's in our audit period. We noted the total number of these adjustments decreased by 48 percent from FY2012 to July 31, 2013.

TVA personnel stated monthly meetings began between the various groups involved in the billing process including: Customer Service, Pricing and Contracts, Transmission, and Metering Services, in addition to Revenue Billing and Power Billing in January 2013. We were told they now review each of the prior month's adjustments, discuss the root cause of each adjustment, and identify areas of high risk to determine if changes to controls need to occur or new controls need to be implemented in these meetings. It appears these monthly meetings are achieving the desired results based on the notable decrease in the number of adjustments in the first 10 months of FY2013. As of July 31, 2013, the number of adjustments made by Power Billing and Revenue Billing had decreased 48 percent from FY2012.

ACCEPTABLE IT GENERAL AND APPLICATION LEVEL CONTROLS OVER ORACLE UTILITIES

We reviewed the SOX testing and corresponding results for IT general controls and IT application controls for data input, rejected transactions, and output. Our reviews of these controls indicated, overall, they were appropriate and adequate to detect/prevent invoice errors. However, we identified a manual control that, if automated, could decrease the risk of improper adjustments and noted access control should be reviewed and updated.

Acceptable IT General Controls

IT general controls apply to all system components, processes, and data, and their purpose is to ensure the proper development and implementation of applications (i.e., programs), as well as the integrity of programs, data files, and computer operations. To generate wholesale invoices, multiple systems are utilized to either collect, provide, or generate information during the billing invoice process. After kW and kWh meter readings are automatically collected and input into the Itron Enterprise Edition (IEE)/Meter Data Management (MDM) system, they are fed via the Billing Data Interchange (BDI) into Oracle Utilities where appropriate rates are applied. Other systems (e.g., Electric Sales Statistics and Real Time Pricing) feed data into Oracle Utilities that is used to calculate other charges and credits, and then the LPC wholesale invoices are generated from Oracle Utilities.

TVA's SOX group tested four of the six IT general controls on a regular basis during the audit period. TVA's SOX group did not test security planning or auditing/monitoring; however, the OIG tested security planning as part of Audit 2014-15059, Federal Information Security Management Act, and identified issues that TVA management indicated they will be addressing. Therefore, we did not review security planning during this audit. The OIG tested auditing and monitoring during this audit.

For the remaining four IT general controls, our review of SOX testing and corresponding results indicated acceptable implementation governing the operation of the Oracle Utilities system. Based on our testing, our review of the

SOX detail testing documentation, reperformance of selected SOX testing, and review of SOX employee qualifications and independence, we determined we could rely on the IT general controls unless our sample testing identified controls that were not functioning properly. The five IT general controls tested by SOX and the OIG and the corresponding results are listed in Table 1 below.

OIG Review of IT General Controls Testing

Control	Results of SOX Testing
Change Control	Acceptable
Contingency Planning	Acceptable
Auditing and Monitoring	Acceptable
Configuration Management	Tested as part of Change Control, Acceptable
Access to Programs and Data	Acceptable

Table 1

Acceptable IT Application Level Controls

We reviewed controls for data input, rejected transactions, and data output, (IT application level controls). Our review of the IT input controls noted edit routines are a core part of the Oracles Utilities application and are how changes and/or adjustments to demand and energy data are made if needed. Automated controls, including change control processes and access controls, exist that prevent unauthorized changes to Oracle Utilities program functionality, such as calculations and tables. Our review of the IT output controls indicated the wholesale invoices, which have confidential information, are protected on TVA Online Connections from view and changes from unauthorized individuals. During our review of rejected transactions, we noted automated controls exist to notify appropriate personnel that meter data transactions have been rejected or errors have occurred.

While these reviews indicated the application controls for data input, rejected transactions, and output were appropriate and adequate to detect/prevent invoice errors, we did note an area where improvement could be made. One input control required different individuals' approval for various adjustment amounts. However, this is a manual control rather than an automated control allowing adjustments to be processed by the system without approval.

RECOMMENDATIONS

We recommend TVA's Vice President and Controller, Corporate Accounting, and the Senior Vice President, Transmission, coordinate as appropriate to address the following recommendations:

1. Maintain e-mail approvals that document the rate change control was performed as required for SOX testing, either on the share drive with appropriate restricted access or hardcopy.

TVA Management's Comments – TVA management agreed to maintain e-mail approvals on the Revenue share drive that documents the rate change control was performed. E-mail documentation was traditionally stored in this manner for wholesale rate changes and, as of March 2013, the monthly rate change e-mails are stored in this manner as well. (See Appendix B for management's complete response.)

Auditor's Response – The OIG concurs with TVA management's response and no further action is necessary.

2. Periodically review Power Billing's controls to determine if they address atypical situations and/or could be strengthened to increase prevention or detection of errors and reduce adjustments.

TVA Management's Comments –TVA management stated the Meter to Cash team that meets on a monthly basis discusses each of the prior month and pending adjustments and looks at the root cause of each to determine if the controls in place are working properly or need to be modified. Power Billing and Revenue's controls are being evaluated and strengthened when needed through this team effort. Additionally, the Power Billing group has internal team meetings monthly to discuss and brainstorm around any metering issues that have come up in the past month. Beginning with the roll forward testing period in October 2014, all SOX controls for Revenue and Power Billing have moved to a management testing model conducted by the Senior Program Manager, Revenue Quality. This will ensure that each control for both groups is being monitored internally and updated or revised as needed. (See Appendix B for management's complete response.)

Auditor's Response – The OIG acknowledges and concurs the monthly Meter to Cash meetings are beneficial; however, this is a reactive control because issues are addressed only after they have occurred. The OIG concurs with TVA management's plans for implementing the management testing model for the SOX controls by the Senior Program Manager, Revenue Quality, where each control is monitored and updated or revised as needed.

3. Implement automated controls requiring appropriate approvals for adjustments based on established threshold amounts.

TVA Management's Comments – TVA management stated that as of May 2014, TVA has automated invoice adjustments associated with the revenue for kW and kWh. The automation should alleviate the concerns around the tiered review process since the majority of adjustments (dollar and volume related) will now be handled systematically. The current tiered review process will stay in place for any one-off adjustments that have to be made manually. (See Appendix B for management's complete response.)

Auditor's Response – The OIG concurs with TVA management's actions and no further action is necessary.

We recommend TVA's Vice President and Controller, Corporate Accounting, and the Vice President, Pricing and Contracts, coordinate as appropriate, and:

4. Automate the transmission of rate changes to Oracle Utilities from source systems. If automating transmission of rate changes is not considered cost beneficial, we recommend implementing one common set of rate classification descriptions to increase the efficiency of updating the rates as well as reduce the risk of manual input errors.

TVA Management's Comments – TVA management agreed to move forward with the automation of rate changes to Lodestar from the source system. Automation of this process was being explored prior to the OIG audit, and Revenue Billing has participated in a working discussion with the IT department on how to attain this goal. The new process should be implemented no later than December 2014. (See Appendix B for management's complete response.)

Auditor's Response – The OIG concurs with TVA management's planned actions.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our audit objectives were to determine if: (1) wholesale invoices were calculated correctly, (2) controls to prevent/detect invoice errors were adequate, and (3) Oracle Utilities (previously Lodestar) had appropriate/adequate information technology (IT) general and application controls. We performed the following to accomplish our objectives:

- To determine if wholesale invoices were calculated correctly, we:
 - Pulled a random sample of 20 out of 4,340 (0.5 percent) wholesale local power company (LPC) invoices, and:
 1. Initially, we selected a statistical random sample of 203 out of 4,340 wholesale LPC invoices (4.6 percent of population). However, after we began tracing all components of each invoice, we realized it would take much longer to verify all 203 sample invoices than originally estimated based on our available resources. Therefore, we decided to pull a nonstatistical random sample of 20 invoices from the random statistical sample of 203 invoices to test. We determined the demand and energy charges on the 20 sample invoices was 99.6 percent of the total dollar charges on the invoices (not including credits), and 93.2 percent of the absolute total dollar value of the invoices (including credits). We decided we would evaluate whether or not we should expand the sample and perform additional invoice testing based on our testing results from verifying the total demand and energy charges on the 20 invoices. We found no errors associated with the demand and energy rates on the 20 invoices and determined those demand and energy rates represented 55 percent of the “standard product” demand and energy rates available to the LPCs during the audit period. Based on our testing results, we determined additional testing of invoices was not necessary. Because we did not verify the information on the entire statistical sample (203 invoices), we did not project the sample results to the population.
 2. Verified demand and energy rates on the 20 sample invoices by obtaining source documentation (e.g., wholesale contracts and rate schedules) and recalculating the rate.
 3. Verified the credits and other charges (nondemand/nonenergy) by obtaining source documentation (e.g., customer contracts and agreements for credit programs, such as Enhanced Growth Credit and Small Manufacturing Credit) and recalculated the amounts. For Minimum Bill Adjustments, Enhanced Growth Credits, Generation Partners (credits), and Green Power (credits), we recalculated the components listed on the invoice and obtained applicable supporting documentation maintained by the Tennessee Valley Authority (TVA) without exception. We did not obtain the applicable individual end-use customer contracts and/or data maintained only at the LPC.

For Discounted Energy Unit (credits) and Start-up and Testing Power Margin (adjustments) we obtained supporting documentation (spreadsheets) from TVA personnel and traced the amount to the invoice without exception. We did not verify all components of the spreadsheet or recalculate the amounts because of the complexity of the calculations, and the amounts for these six credits and other charges represented less than 0.3 percent of the total amount billed on the invoice.

4. Reviewed documentation regarding how rate changes are tracked and entered for billing purposes. We tested the manual Sarbanes-Oxley (SOX) control regarding rate change verification for rates applicable to the sample of 20 invoices.
- To determine if controls to prevent/detect invoice errors were adequate, we:
 - Obtained an understanding of the processes and procedures related to TVA Revenue Billing and invoicing of LPCs. To accomplish this, we:
 1. Obtained and reviewed organizational charts applicable to the audit period.
 2. Interviewed the senior manager, manager, program manager, and other relevant personnel of Revenue Billing and Power Billing.
 3. Obtained and reviewed TVA's Standard Programs and Processes (SPP); TVA-SPP-13.60, Revenue (effective November 7, 2012), and FSO-SPP 13.62, Power Billing (Draft version).
 4. Obtained and reviewed TVA-SPP-13.064, TVA Meter to Cash Process (effective October 1, 2013), after the audit period.
 5. Obtained documentation and created a flowchart of the various systems.
 - Obtained information on SOX PMO controls and/or processes in place to prevent/detect invoice errors by interviewing key personnel.
 - Obtained a listing of all invoice adjustments identified during the audit period, determined which adjustments were specifically the responsibility of either Revenue Billing or Power Billing (209 data records, which consisted of 551 adjustments), and chose a sample of 20 data records (10.45 percent). We determined we would use nonstatistical, random sampling rather than statistical due to the small population. Therefore, we did not project the sample results to the population. For that sample of 20 data records, which was 48 adjustments, we determined:
 1. Why the error occurred,
 2. How the error was identified, and
 3. Whether or not the appropriate action was taken.

- Discussed controls in place with Revenue Billing and Power Billing to see if any were in place to identify repeat errors.
- To determine if Oracle Utilities had appropriate/adequate IT general controls, we reviewed and summarized TVA's SOX detail testing results, performed testing, reviewed applicable policies and procedures, and discussed procedures with Revenue Billing and Power Billing personnel for IT general controls to determine if controls were in place for:
 1. Change Control – Reviewed SOX testing.
 2. Contingency Planning – Reviewed SOX testing.
 3. Auditing and Monitoring – The Office of the Inspector General tested.
 4. Configuration Management – Reviewed SOX testing.
 5. Access to Programs and Data – Reviewed SOX testing.

Based on our testing, our review of the SOX detail testing documentation, reperformance of selected SOX testing, and review of SOX employee qualifications and independence, we determined we could rely on the IT general controls and application controls unless our sample testing identified controls that were not functioning properly.

Our audit of Oracle Utilities general IT controls did not include controls related to System Planning/Risk Assessment. These controls were reviewed by the Office of the Inspector General in Audit 2014-15059, Federal Information Security Management Act, which identified issues TVA management has indicated they will be addressing.

- To determine if Oracle Utilities had appropriate/adequate application controls for:
 1. Data Input – We determined where the invoice inputs originated, who approved the invoices, and what controls existed to ensure all LPCs were invoiced, and the correct demand and energy amounts were billed. This included gaining an understanding of and testing data (IT) input procedures. Specifically, we obtained the approval levels and determined whether the responsibility assigned for verifying appropriate approvals were consistently applied. We also determined whether individuals responsible for entering data had been trained on the preparation, entry, and control of input; edit routines were embedded within the application; and controls existed to prevent unauthorized changes to the system.
 2. Rejected Transactions – We verified transaction controls were in place to notify the process owner when transactions were rejected or errors occurred, and reports existed to identify and track reprocessing of rejected transactions.

3. Data Output – We obtained data output procedures and verified individuals responsible for data entry were trained and verified the data output. We also verified the output: (a) was reviewed against source documents and (b) for sensitive or confidential information and how it is protected.

When evaluating the results of our audit work, we used both quantitative and qualitative factors when considering the significance of an item. The quantitative factor we considered in determining an item's significance was:

- If the dollar value of an error(s) exceeds 0.5 percent of TVA's 2012 revenue it would be considered significant; therefore, the threshold for quantitative significance is \$47.5 million.

The qualitative factor(s) we considered in determining an item's significance were:

- If TVA gives preferential treatment to certain distributors, or
- If the item impacts TVA revenue or reputation by violating policies and procedures or Power Contracts.

Our audit scope included all wholesale invoices from April 1, 2011, through July 31, 2013, billed to the 155 LPCs and the controls applicable to preparing the invoices during the audit period. Our scope did not include verifying the completeness and accuracy of the meter readings imported into Oracle for demand and energy. Our fieldwork was conducted between August 2013 and July 2014.

This performance audit was conducted in accordance with generally accepted government auditing standards. Those standards require we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Tennessee Valley Authority



August 28, 2014

David P. Wheeler, ET 3C-K

RESPONSE TO REQUEST FOR COMMENTS – DRAFT AUDIT 2013-15106 – REVENUE
BILLING INVOICE PREPARATION

In response to the request for comments dated July 29, 2014, a review of the draft audit has been completed.

Based on the recommendation of the subject audit, Revenue has partnered with Power Billing, and IT to develop the following plan of action to address each recommendation.

1. TVA agrees to maintain e-mail approvals on the Revenue share drive that documents the rate change control was performed. E-mail documentation was traditionally stored in this manner for wholesale rate changes and, as of March 2013, the monthly rate change e-mails are stored in this manner as well.
2. As noted in the report, TVA established a Meter to Cash team that meets on a monthly basis which includes the following groups: Customer Resources, Transmission and Metering Services, Power Billing and Revenue. This team discusses each of the prior month and pending adjustments and looks at the root cause of each to determine if the controls in place are working properly or need to be modified. Power Billing and Revenue's controls are being evaluated and strengthened when needed through this team effort. Additionally, the Power Billing group has internal team meetings monthly to discuss and brainstorm around any metering issues that have come up in the past month. Beginning with the roll forward testing period in October 2014, all SOX controls for Revenue and Power Billing have moved to a management testing model conducted by the Senior Program Manager, Revenue Quality. This will ensure that each control for both groups is being monitored internally and updated or revised as needed.
3. As of May 2014, TVA has automated invoice adjustments associated with the revenue for kW and kWh. The automation of this process should alleviate the concerns around the tiered review process since the majority of adjustments (dollar and volume related) will now be handled systematically. The current tiered review process will stay in place for any one-off adjustments that have to be made manually.
4. TVA agrees to move forward with the automation of rate changes to Oracle Utilities from the source system. Automation of this process was being explored prior to the OIG audit and Revenue Billing has participated in a working discussion with the IT department on how to attain this goal. The new process should be implemented no later than December 2014.

As noted in the audit report, Power Billing left Financial Services in February 2014, and is now a part of the Right-of-Way and Meter Management organization under the Transmission division. TVA believes the Meter to Cash team will help ensure that Revenue, and Power Billing continue to focus on the same issues and keep intact a good working relationship between the two groups. Additionally, TVA added the role of Senior Program Manager, Revenue Quality in May of 2014. This role will work to support both Revenue and Power Billing in their efforts to identify

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and address issues prior to invoicing as well as coordinating continuous improvement initiatives for both groups.

We would like to thank the OIG team for their professionalism in conducting this audit. If you have any questions or if you need additional information, please contact Leslie Bazzoon at (865) 632-4003.



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