Memorandum from the Office of the Inspector General

June 13, 2017

Cassidy L. Larson, MR 3M-C
Diane T. Wear, WT 4B-K

FINAL REPORT – EVALUATION 2017-15463 – FUEL COST ADJUSTMENT CALCULATION

Attached is the subject final report for your review. Your written comments, which addressed your actions taken, have been included in the report. No further action is needed at this time.

If you have any questions, please contact David S. Shields, Evaluations Manager, at 865-633-7364 or E. David Willis, Director, Evaluations, at (865) 633-7376. We appreciate the courtesy and cooperation received from your staff during the evaluation.

David P. Wheeler

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

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Attachment
cc (Attachment):
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OIG File No. 2017-15463

Office of the Inspector General

Evaluation Report

To the Vice President, Pricing and Contracts and the Vice President and Controller, Corporate Accounting

FUEL COST ADJUSTMENT CALCULATION

Evaluation Team
David S. Shields
Claire E. Blackstock

Evaluation 2017-15463
June 13, 2017

ABBREVIATIONS

Board	TVA Board of Directors
FCA	Fuel Cost Adjustment
kW	Kilowatt
kWh	Kilowatt Hour
Pricing	Pricing and Contracts
RCA	Resource Cost Allocation
TVA	Tennessee Valley Authority

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APPENDIX

Evaluation 2017-15463 – Fuel Cost Adjustment Calculation

EXECUTIVE SUMMARY

Why the OIG Did This Evaluation

The Tennessee Valley Authority (TVA) Act assigns rate setting duties to the TVA Board of Directors (Board). The rates approved by the Board include the formula used to calculate the monthly fuel cost adjustments (collectively referred to as FCA). TVA's FCA represents approximately one-third of the wholesale rate. Due to the importance of TVA correctly calculating the FCA, we performed an evaluation of the calculation. The objective of our evaluation was to determine whether the FCA was calculated according to the "Board-approved formula."[i] The scope of our work was the calculation of the January 2017 FCA rates.

What the OIG Found

Based on our independent recalculation of the January 2017 FCA rates, we determined all but one component of the FCA was calculated in accordance with the Board-approved formula, with the exception being the resource cost allocation (RCA).[ii] We noted TVA's method of calculating the RCA used in the FCA calculation was not in agreement with the approved methodology. Specifically, while calculating the RCA, TVA did not appropriately categorize some direct-served, federal, and interdivisional customers, based on their contract demand.

According to TVA, the RCA error resulted in approximately a $25,000 over-allocation of deferred expenses to the Non-Standard Service account[iii] and a $25,000 under-allocation to the Standard Service deferred account,[iv] for November 2016.[v] Based on TVA's calculations, the January FCA rate for Non-Standard Service Customers would have decreased by 0.001¢ per kilowatt hour and the Standard Service FCA rate would have been unchanged. Furthermore, TVA determined that over a 16-month period (October 2015 through January 2017), this miscalculation

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i Our use of the term "Board-approved formula" is intended to include the formula, methods, and instructions, collectively, as described by the Board-approved (1*) Adjustment Addendum to The Schedule of Rates and Charges for Distributor* and (2) *Adjustment Addendum to Direct Service Power Rates Schedules.*

ii To more accurately allocate fuel costs to customers based on the costs those customers create, an RCA was incorporated into the FCA effective for fiscal year 2016. The RCA assigns variable costs based on usage and power supply cost for each hour of the year.

iii Non-Standard Service Customers include Distributor-served customers with contract demands greater than 5,000 kilowatt (kW), customers served under schedules Time Differentiated General Service A Class and Time Differentiated Manufacturing Service A Class, and customers served directly by TVA with contract demands greater than 1,000 kW.

iv Standard Service Customers are customers for which Distributors are billed under Standard Service charges and all other customers with contract demands less than or equal to 1,000 kW.

v The November 2016 RCA was used to calculate the January 2017 FCA rates. This is in compliance with the Board-approved formula.

of the RCA led to errors of about (1) $449,000 too much deferred cost in the Non-Standard Service Customer deferred account and (2) $462,000 too little deferred cost in the Standard Service Customer deferred account.[vi]

What the OIG Recommends

We recommend TVA's Vice President, Pricing and Contracts, develop and implement controls to ensure proper categorization of customers during the RCA calculation.

TVA Management's Comments

TVA management generally agreed with our facts, findings, and recommendation and has implemented controls to address our recommendation. Please see the Appendix for TVA management's complete response.

[vi] TVA stated the total fuel revenue during this same period was approximately $4 billion.

BACKGROUND

The Tennessee Valley Authority (TVA), like many businesses, has both fixed and variable costs that it must recover. According to TVA, most of its costs (such as depreciation and interest expense) are fairly stable, and variations in this type of cost may be adequately recovered through base rates and base-rate adjustments. However, TVA's largest single expense, fuel and purchased power cost, can be volatile from month-to-month. Since these costs can fluctuate significantly with changes in weather and shifts in global supply and demand, TVA recovers these variable costs through the fuel cost adjustment (FCA). These charges specifically cover the costs of the fuel (e.g., nuclear, coal, oil, natural gas) that TVA uses to generate electricity and purchased power. The FCA represents approximately one-third of the total wholesale rate.

TVA instituted the FCA in October 2006 after experiencing the spike in fuel costs caused by Hurricanes Katrina and Rita the previous year. Initially, the FCA was based on quarterly periods, but the quarterly period responded too slowly to market volatility, at one point resulting in a large over-collection. In October of 2009, TVA transitioned to a monthly FCA.

The FCA includes: (1) the direct cost of fuel used in TVA's generating plants, (2) certain variable fuel-related costs, and (3) the energy cost of purchased power. Examples of direct fuel costs included in the FCA are the costs of coal burned in TVA's coal plants, which includes transportation charges. A variable fuel-related cost is the cost of physical coal inventory surveys. Examples of related costs that are excluded from the FCA are maintenance on rail cars and fuel analysis. In fiscal year 2016, TVA calculated FCA eligible fuel costs to be approximately $2.9 billion.

There are two main components that comprise the monthly FCA calculation: *Core* and *Deferred.*[1] Core is a forecast of anticipated fuel and purchased power costs for the month, and Deferred is a settlement of any costs that TVA, over or under, collected from prior forecasts. Before the start of each month, TVA prepares a forecast of fuel and purchased power costs for the coming month. Following the end of the month, the amount that was collected through the FCA is compared to the fuel and purchased power costs actually incurred during that period. Any difference, referred to as a deferral, is carried forward in future FCA amounts. Deferred amounts start to be recovered, on average, about 2 months after costs.

The TVA Act assigns rate setting duties to the TVA Board of Directors (Board). The rates approved by the Board include the formula and methodology used to calculate the monthly FCA. On August 21, 2015, the Board approved a change to the FCA, effective for fiscal year 2016. To implement the change, TVA developed

[1] The deferred component is comprised of several component calculations. These include the (1) resource cost allocation (RCA), (2) true-up amount, (3) general ledger deferred account balance, and (4) deferred account.

an RCA to allocate fuel costs based on the costs customers create.[2] Since that time, TVA has calculated two separate FCA rates (collectively referred to as FCA), one for Non-Standard Service Customers (generally large industrial customers)[3] and another for Standard Service Customers (generally residential and business customers)[4] as required by the *Adjustment Addendum to The Schedule of Rates and Charges for Distributor*, effective October 1, 2015, and the *Adjustment Addendum to Direct Service Power Rates Schedules*, effective October 1, 2015. (Although the inputs for each Adjustment Addendum may differ, the FCA calculation methodology is the same and therefore, for the remainder of this report, we refer to both documents collectively as the "Adjustment Addendum".)

Due to the importance of TVA correctly calculating the FCA, we performed an evaluation of the calculation.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of our evaluation was to determine whether the FCA was calculated correctly and in accordance with the "Board-approved formula."[5] The scope of our work was the calculation of the January 2017 FCA rates. We did not verify the accuracy of the inputs used in the FCA calculations. Accordingly, we are providing no assurance related to whether or not the FCA calculations are accurate. To achieve our objective, we:

- Interviewed employees in the Financial Services and External Relations organizations to gain an understanding of (1) the FCA calculation process and identify the current authoritative guidance and (2) the differences in customer categories as they apply to the RCA.
- Reviewed the Adjustment Addendum to determine the current FCA formula and methodology approved by the Board on August 21, 2015, and implemented on October 1, 2015.
- Obtained input values to reperform the calculation of the January 2017 FCAs (we did not test the accuracy of inputs). These inputs included: (1) sales in kilowatt hour (kWh) and incremental hourly power supply costs in dollars per megawatt hour used in TVA's calculation of the RCA, (2) FCA eligible sales and revenue amounts (3) general ledger deferred account balances (4) actual fuel expense data, and (5) forecasted sales and expense data.
- Developed a spreadsheet to independently recalculate the January 2017 FCA rates in accordance with the methodology required by the Adjustment

[2] The RCA assigns variable costs based on usage and power supply cost for each hour of each billing period.

[3] Non-Standard Service Customers include Distributor-served customers with contract demands greater than 5,000 kilowatt (kW), customers served under schedules Time Differentiated General Service A Class and Time Differentiated Manufacturing Service A Class, and customers served directly by TVA with contract demands greater than 1,000 kW.

[4] Standard Service Customers are customers for which Distributors are billed under Standard Service charges and all other customers with contract demands less than or equal to 1,000 kW.

[5] Our use of the term "Board-approved formula" is intended to include the formula, methods, and instructions, collectively, as described by the Adjustment Addendum.

Addendum. We compared the OIG calculated rates to the rates that went into effect January 2017.

This evaluation was performed in accordance with the Council of the Inspectors General on Integrity and Efficiency's *Quality Standards on Inspection and Evaluation*.

FINDING

Based on our independent recalculation of the January 2017 FCA rates, we determined all but one component of the FCA was calculated in accordance with the Board-approved formula, with the exception being the RCA. We noted TVA's method of calculating the RCA used in the FCA calculation was not in agreement with the approved methodology. Specifically, while calculating the RCA, TVA did not appropriately categorize some direct-served, federal, and interdivisional customers, based on their contract demand.

RCA COMPONENT INCORRECTLY CALCULATED

TVA's Adjustment Addendum requires separating TVA's customers into two categories—Non-Standard Service or Standard Service. During our testing of the RCA component, we noted TVA had taken steps to categorize distributors' customers into one of the two categories. However, we determined TVA had included all direct-served customers in the Non-Standard Service Customer category, which was noncompliant with the methodology specified in the Adjustment Addendum.

TVA initially informed us that all direct-served customers met the criteria for the Non-Standard Service Customer category. To corroborate TVA's assertion, we conducted additional fieldwork and determined there was at least one direct-served customer with a contract demand less than 1,000 kW, which met the criteria of a Standard Service Customer. We presented this information to personnel in TVA's Pricing and Contracts group (Pricing). Pricing analyzed our finding and concluded 8 direct-served customers were miscategorized. In addition, Pricing found there were also 29 interdivisional customers and 1 federal customer that had been miscategorized in the Non-Standard Service Customer class. Pricing determined the customers were miscategorized when the Adjustment Addendum became effective on October 1, 2015.

In response to our identification of the RCA miscalculation, TVA management provided our office with an analysis of the impacts of the error. According to TVA's analysis, for November 2016, the RCA error resulted in approximately a $25,000 over-allocation of deferred expenses to the Non-Standard Service account and a $25,000 under-allocation to the Standard Service deferred account.[6] Table 1 on the following page shows the impact of the error to the January 2017 kWh rates:

[6] The November 2016 RCA was used to calculate the January 2017 FCA rates. This is in compliance with the Adjustment Addendum.

	January 2017 FCA Rates (¢ per kWh)		
	As Charged	**Revised**	**Change**
Non-Standard Service	¢ 2.111	¢ 2.110	¢ (0.001)*
Standard Service	¢ 2.143	¢ 2.143	¢ -

***This amount is equivalent to 1 cent per megawatt hour.**

Table 1

Due to the miscategorization of some of the Standard Service direct-served, federal, and interdivisional customers as large customers, extra costs were accrued in the Non-Standard Service Customer deferred account, and not enough costs were accrued in the Standard Service deferred account. TVA determined that, over a 16-month period (October 2015 through January 2017), this miscalculation of the RCA led to errors of about (1) $449,000 too much deferred cost in the Non-Standard Service Customer deferred account and (2) $462,000 too little deferred cost in the Standard Service Customer deferred account. For context, TVA management stated the total fuel revenue during this same period was approximately $4 billion.

TVA subsequently made a journal entry to adjust the deferred account balances described above. According to TVA, the differences will begin to be trued-up with the issuance of the May 2017 FCA.

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In conclusion, TVA was not calculating the RCA component of the FCA in full compliance with the Board-approved Adjustment Addendum. During the 16-month period, TVA's deviation from the required methodology resulted in costs being misallocated to the deferred accounts of the 2 customer categories, as defined in the Adjustment Addendum. These misallocated costs were less than $500 thousand of $4 billion in eligible FCA expenses. Even though the misallocated amount was a small fraction of the total each month, it was enough to impact the January 2017 rate. As such, it underscores the importance of ensuring the RCA calculation is correct each month.

RECOMMENDATION

We recommend TVA's Vice President, Pricing and Contracts, develop and implement controls to ensure proper categorization of customers during the RCA calculation.

TVA Management's Comments – TVA management generally agreed with our facts, findings, and recommendation. TVA has implemented controls to ensure the proper categorization of customers during the RCA calculation. TVA management also suggested some wording changes for clarification which were incorporated into our report as appropriate. Please see the Appendix for TVA management's complete response.

Auditor's Response – We concur with management's completed actions and have reviewed supporting documentation to verify the implementation of the recommendation.

Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

June 7, 2017

Mr. David P. Wheeler
Assistant Inspector General
Audits and Evaluations
Tennessee Valley Authority
400 West Summit Hill Drive, ET 3C
Knoxville, Tennessee 37902

Subject: TVA Staff Comments on Draft Evaluation 2017-15463 - Fuel Cost Adjustment Calculation

Mr. Wheeler:

Pricing and Contracts, in collaboration with the Controller's office, has reviewed your draft report on the evaluation your staff performed on the Total Monthly Fuel Cost referenced above.

We are in general agreement with the facts, conclusions, and recommendations you have made. Remediation on the recommendation was completed in April 2017 in time for the May 2017 fuel cost adjustment and is explained in further detail on page 2. Also, we do note a couple items, summarized on page 2, for your further consideration in the report.

Thank you.

Cassidy L. Larson
Vice President
Pricing and Contracts

MRH:NPT
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Summarized Comments on Draft Evaluation 2017-15463
Fuel Cost Adjustment Calculation

Subject	Agreement (Suggestions for clarification in bold)	Disagreement (Suggestion)
Facts:	Page 1, 4th paragraph, second sentence …. Core is a forecast …. and Deferred **is a settlement of costs which TVA, over or under collected from prior forecasts.** Page 1, 4th paragraph, second to last sentence …. **Any difference, referred to as a deferral**, is carried forward …. Page 1, 4th paragraph, last sentence …. **Deferred amounts** start to be recovered, Page 1, Footnote 1 … **The deferred component is comprised of general ledger deferred account balance.** Page 2, end of paragraph following Objective, Scope, last full sentence …. no assurance related to whether **the amounts recovered through the FCA are accurate.** Page 2, footnote 2 The RCA assigns variable costs based on usage and power supply cost for **each hour of each billing period**.	None.
Conclusions:	Agreed to conclusions.	None
Recommendations:	We agree with the recommendation to implement controls to ensure proper categorization of customers during the RCA Calculation. The controls were actually put in place immediately following the discovery of the misclassification. The controls were put in place in early April 2017 in time for the development of the May 2017 FCA. The controls include a query which is run each month at the time of the RCA calculation is performed, to determine the contract demand of each customer prior to the aggregation of the hourly loads going into the RCA calculation.	None.