



**OFFICE OF THE PUBLIC AUDITOR
REPUBLIC OF PALAU**

AUDIT REPORT

**ON AUTOMATIC FUEL PRICE
ADJUSTMENT CLAUSE (AFPAC)**



**PALAU PUBLIC UTILITIES CORPORATION
REPUBLIC OF PALAU**

FOR THE PERIOD FROM OCTOBER 1, 2014 TO SEPTEMBER 30, 2016

Performed by the Office of the Public Auditor

PPUC-AFPAC-16-P05*opa00

REPUBLIC OF PALAU



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January 30, 2019
Serial#: opa19-034au

Mr. Greg Decherong
Board Chairman/Acting CEO/GM
Palau Public Utilities Corporation
Koror, Republic of Palau

Subject: Final Report on the Audit of PPUC's AFPAC

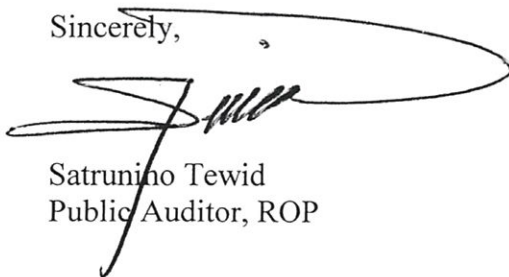
Dear Acting Chief Executive Officer Decherong:

Transmitted herewith is the final audit report on the Palau Public Utilities Corporation's (PPUC) Automatic Fuel Price Adjustment Clause (AFPAC).

The Office of the Public Auditor (OPA) received your response to the Draft Audit Report. The response is published verbatim in the final report.

If you have any questions regarding the report or subject matters discussed therein, the OPA will be available to discuss them at your request.

Sincerely,



Satrunino Tewid
Public Auditor, ROP

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REPUBLIC OF PALAU



Office of the Public Auditor

January 30, 2019

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Dear Acting Chief Executive Officer Decherong:

At the request of the Senate of the Tenth Olbiil Era Kelulau, the Office of the Public Auditor (OPA) conducted an audit of the Palau Public Utilities Corporation's (PPUC) Automatic Fuel Price Adjustment Clause (AFPAC). The scope of the audit covered the period from October 1, 2014 to September 30, 2016.

The objective of the audit was to determine if:

- Appropriate controls were in place to ensure quarterly fuel tariffs (AFPAC) were computed properly and accurately
- PPUC has consistently and appropriately applied the fuel tariff (AFPAC) methodology put into effect in 2012
- The AFPAC fuel tariff methodology implemented to allow PPUC to recover its fuel costs operates as intended by law

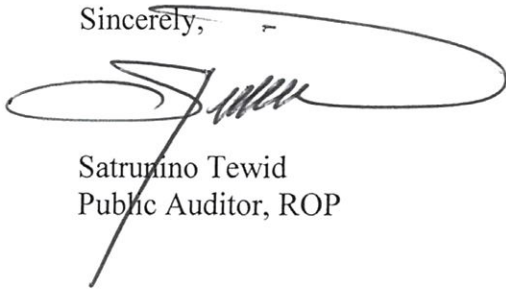
A Draft copy of the report was provided to PPUC on October 25, 2018 for its review and comment. The Office of the Public Auditor received PPUC's response to the Draft report on January 4, 2019. The response contained PPUC's comments to each of the findings in the report, which are published verbatim in the Findings and Recommendations section in this report.

The OPA has established an audit recommendation tracking system to keep track of the status of findings and recommendations issued in this report. Accordingly, the OPA will conduct follow up procedures on your response and corrective action measures to assess their implementation and operation. On a semi-annual basis, June 30 and December 31, of each year, the OPA will report the status of the findings and recommendations to the Office of the President and the Presiding Officers of the Obiil Era Kelulau for their information and disposition.

Office of the Public Auditor

The Office of the Public Auditor would like to thank the staff and management of the PPUC for the professional courtesy and cooperation extended to us during the audit.

Sincerely,

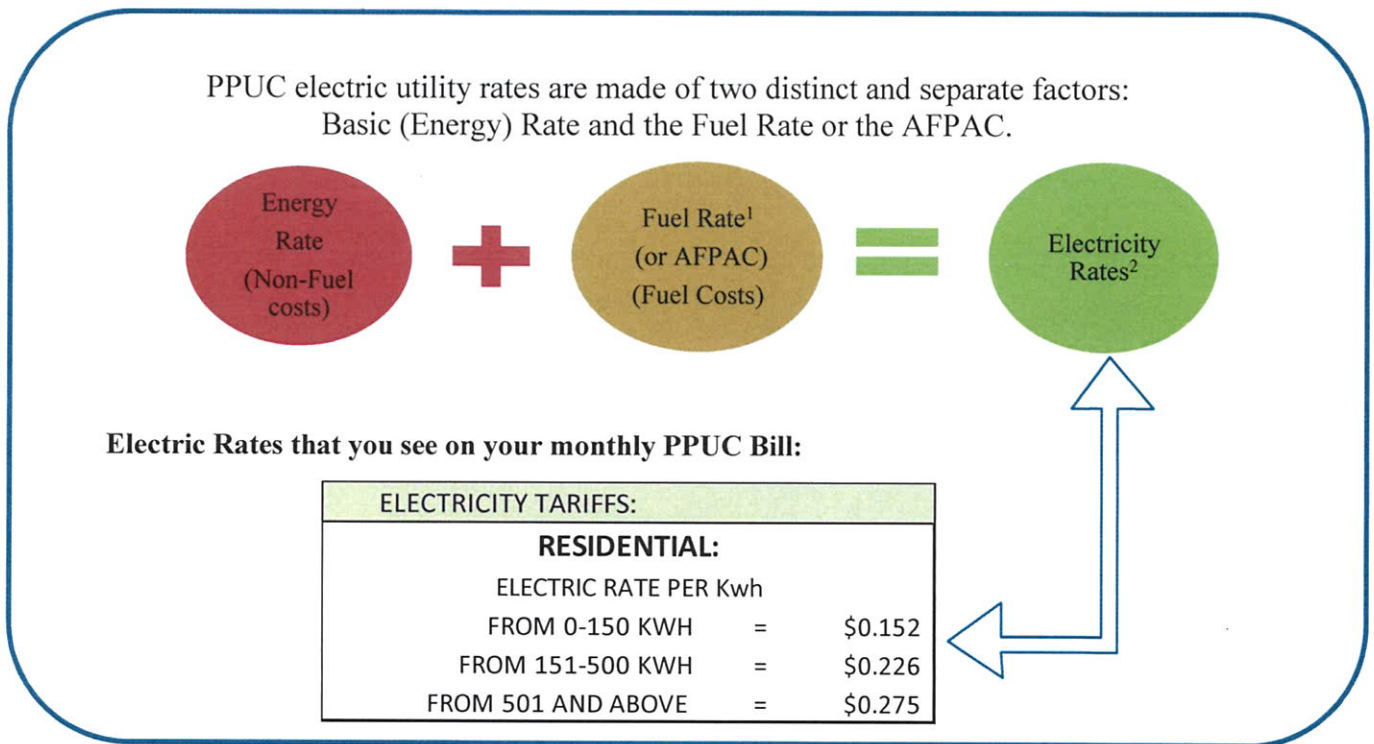
A handwritten signature in black ink, appearing to read "Saturnino Tewid". The signature is stylized with a large, sweeping loop on the left side and several vertical strokes on the right. It is positioned above the printed name and title.

Saturnino Tewid
Public Auditor, ROP

I. RESULTS IN BRIEF

We conducted a performance audit of the Automatic Fuel Price Adjustment Clause (AFPAC), fuel rate portion (fuel cost-recovery component) of electricity rates, set by management of the Palau Public Utilities Corporation (PPUC) to determine if:

- Appropriate controls were in place to ensure quarterly fuel tariffs (AFPAC) were computed properly and accurately
- PPUC has consistently and appropriately applied the fuel tariff (AFPAC) methodology put into effect in 2012
- The AFPAC fuel tariff methodology implemented to allow PPUC to recover its fuel costs operates as intended by law



¹ For clearer understanding and readability, Fuel Rate and AFPAC are synonymous terms in this audit report.

² Separate from the Energy rate and Fuel rate is the fixed service charge at \$3.00 for residential customers and \$11.00 for commercial and government customers.

Our performance audit found weaknesses in controls over ensuring the accuracy and completeness of data input into Excel worksheets used to compute the AFPAC rate. We also found inconsistencies in the application of the AFPAC calculation and disproportionate application of specific components of the AFPAC. Through this audit report, we provide areas of opportunities for PPUC management and its Board to improve on.

We provided a draft of this report to the PPUC management for review and comment. PPUC's comments are included in the Findings and Recommendations section in this report followed by the OPA's response to those comments.

II. WHY WE DID THIS AUDIT

In September and October 2017, the Office of the Public Auditor (OPA) received a request from several Senators and the Chairman of the Senate Committee on Ways and Means and Financial Matters respectively requesting an audit of the PPUC, which, among other concerns, to conduct a review on the implementation of the Automatic Fuel Price Adjustment Clause (AFPAC), the fuel-rate component of the PPUC's electricity rates.

We issued a formal engagement letter to PPUC Board and management on October 26, 2017, and officially started our audit of the fuel rate in November 2017.

III. AUDIT OBJECTIVE

We conducted this audit to answer the following questions, with respect to the fuel rate component of the electricity rate setting structure:

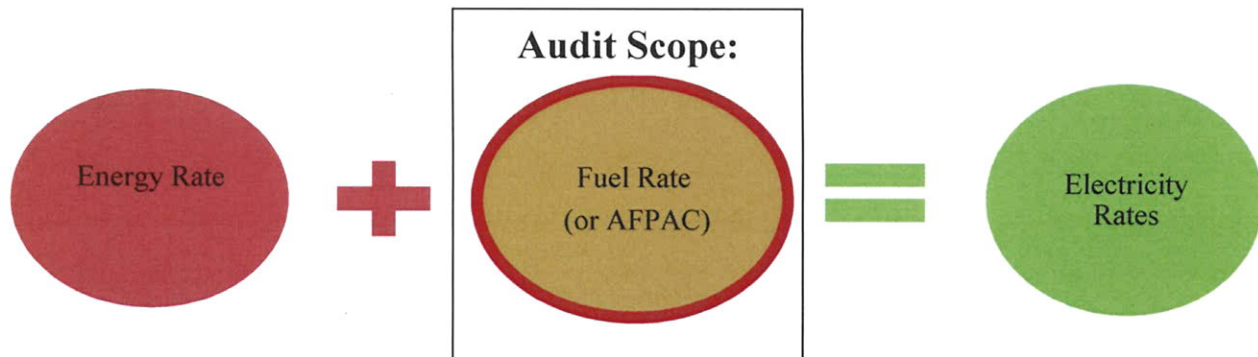
- 1) Did PPUC have appropriate controls in place to ensure quarterly fuel tariffs (AFPAC) were computed properly and accurately?
- 2) Did PPUC consistently and appropriately apply the fuel tariff (AFPAC) methodology put into effect in 2012?
- 3) Did the AFPAC fuel tariff methodology implemented to allow PPUC to recover its fuel costs operate as intended by law?

IV. AUDIT SCOPE

The scope of this performance audit included a review of the PPUC's fuel rate for the following periods:

- We reviewed fuel rates effective from October 1, 2014 through September 30, 2016, which covers fuel rates effective in fiscal years 2015 and 2016.
- We reviewed fuel costs, which comprises diesel fuel, oil, lube and transportation charges incurred from April 1, 2014 through March 31, 2016, constituting fuel costs recovered for the effective AFPAC periods.

The scope of our audit focused solely on fuel rates for conventional meters, and did not include fuel rates for prepaid meters, also commonly known as PPUC tokens.



An illustration of the scope of this audit is found on Appendix A, page 22.

Additionally, we did not look at PPUC's Energy Loss Program adjustments, which is the third component of the fuel rate. When reviewing the worksheets and supporting files provided by PPUC, the third component did not have any impact on the rate computations, and to complete the audit in a timely manner, our office decided to exclude this third component from our audit.

V. BACKGROUND

The Palau Public Utilities Corporation (PPUC) is a government-owned public corporation, which is the sole provider of water, sewer and electricity services for the citizens of the Republic of Palau. On June 6, 2013, RPPL No. 9-4 was signed into law, consolidating the two independent public corporations, the Palau Water & Sewer Corporation and the Palau Public Utilities Corporation, under one umbrella, Palau Public Utilities Corporation. The intent of the merger was to streamline administrative functions and reduce operating costs of two distinct and separate entities by merging them into one. The Electrical Power Operations (EPO) and Water and Wastewater Operations (WWO) are treated as separate business segments having their own organizational chart delineating a chain of command. Shared administrative costs and expertise are allocated to the two separate business segments and are not utilized to subsidize each other.

The Electrical Power Operation is responsible for providing electricity services to Koror, Airai, entire Babeldoab area, and the outlying states comprising of Kayangel, Peleliu and Angaur. The primary power plants are located in Malakal and Aimeliik to service Koror, Airai and Babeldoab, and the remaining three smaller plants service the outlying states.

An underlying principle in electricity rate-setting design deals with the link between the individual prices that PPUC charges each class of customer and the manner in which these rates are structured. PPUC bears the sole responsibility for proposing electric rates in the Republic, thus, it is important that the methodologies for electric rate-setting are transparent so that outcomes acceptable to the Republic, PPUC and its customers are achieved.

PPUC implemented the “Schedules of Electric Service Rates” (referred to in this report as Tariff Schedule) effective October 1, 2012 that provide the basis for rate-setting methodology for electricity tariffs that are computed, adjusted quarterly and managed by EPO management. According to PPUC’s effective Tariff Schedule, it includes a Summary of Electric Rates comprised of eleven (11) components, which, among other things, define the components and data figures used to compute and adjust electricity tariffs on a quarterly basis.

List of Components in PPUC’s Tariff Schedule listed under Summary of Electricity Rates:

| | |
|-------------------|---|
| Schedule A | Monthly Fixed Charge |
| Schedule B | Base Rate |
| Schedule C | Automatic Fuel Price Adjustment Clause |
| Schedule D | RE Feed-in Rate |
| Schedule E | PPUC Energy Credit |
| Schedule F | Demand Charge |

| | |
|------------|---------------------------|
| Schedule G | Power Factor Charge |
| Schedule H | Stand-By Charge |
| Schedule I | Infrastructure Impact Fee |
| Schedule J | General Service Charge |
| Schedule K | Terms and Definitions |

This audit was conducted with a focus solely on Schedule C: Automatic Fuel Price Adjustment Clause (AFPAC), also known as Fuel Rate.

As such, a brief background on the components of the AFPAC (Fuel Rate) is necessary in order to provide the context from which the OPA performed its audit and testing of the Fuel Rate.

What is the Automatic Fuel Price Adjustment Clause (AFPAC):

RPPL 9-4, The Utilities Consolidation Act, § 411 (9) designates PPUC the responsibility to establish and implement a structure of rates for electrical services and facilities calculated to ensure that adequate and equitable charges are imposed for its services.

In line with this mandate, the PPUC established and implemented the Automatic Fuel Price Adjustment Clause or “AFPAC”. The AFPAC is a quarterly fuel charge tariff intended to recover the costs of fuel consumption by PPUC for the purpose of generating electricity. The purpose of the AFPAC is to ensure that any increase or decrease in the cost of fuel (incurred by PPUC) is passed-through to ensure PPUC maintains sufficient revenues to meet operating fuel cost. As defined by Schedule C of the Tariff Schedule, fuel costs include cost of diesel fuel, related transportation and lubricating oil used by the PPUC power plants.

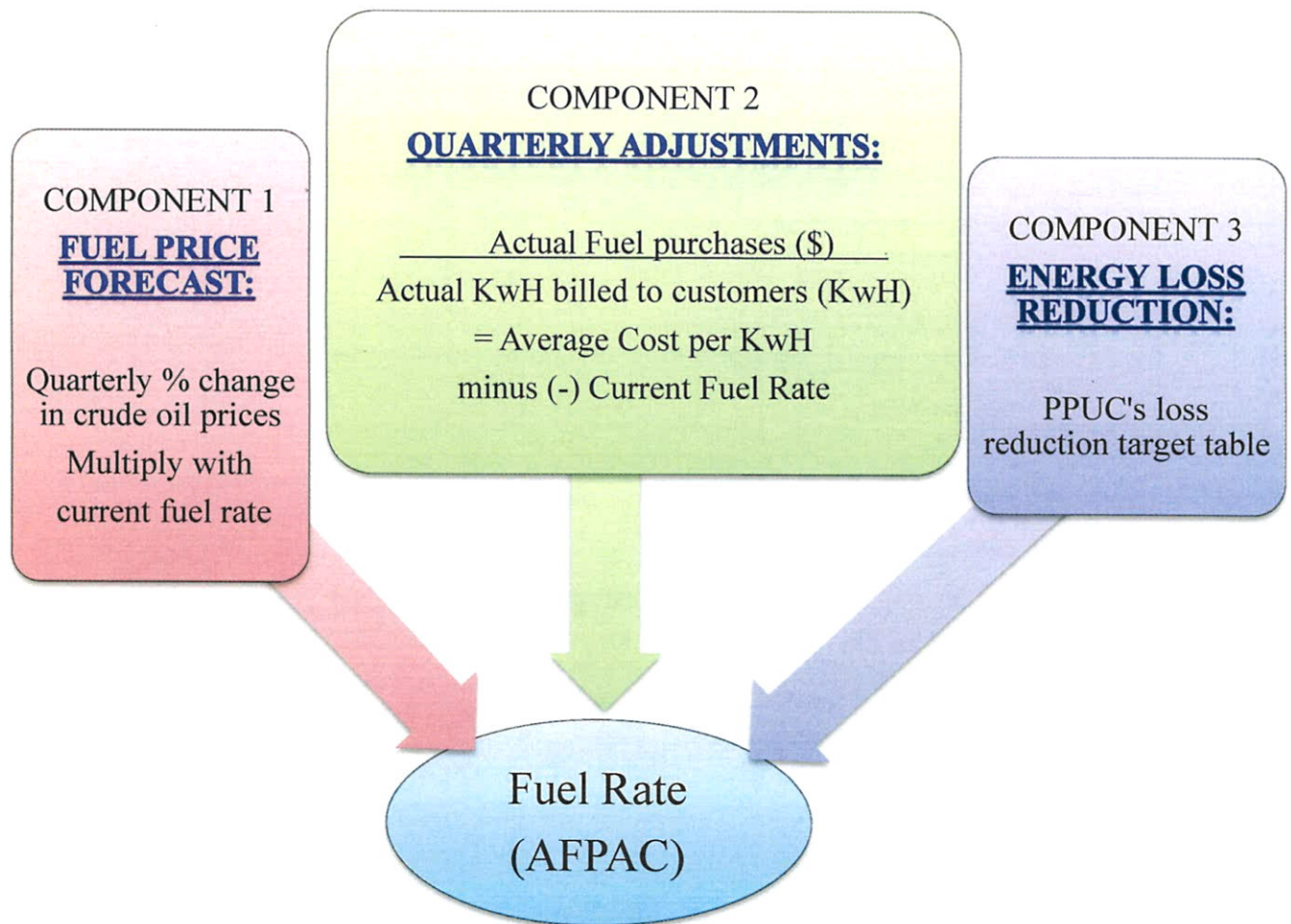
For the last five years, the cost of fuel over PPUC’s operating expense was between 42% to 69%. Fuel cost is an external cost outside of PPUC’s control. The following table is an illustration of PPUC’s Fuel costs for the past 5 years based on audited financial reports.

Table I: 5-year historical ratio of Fuel cost to Operating expenses
 Source: PPUC Audited FS (\$\$\$ Rounded)

| Fiscal year | 2017 | 2016 | 2015 | 2014 | 2013 |
|------------------------|--------------|--------------|--------------|--------------|--------------|
| Fuel Cost (A) | \$11,520,500 | \$10,136,000 | \$14,555,200 | \$18,732,300 | \$18,828,600 |
| PPUC Oper. Expense (B) | \$26,689,700 | \$23,980,700 | \$28,061,000 | \$31,636,900 | \$27,429,200 |
| % of A to B | 43% | 42% | 52% | 59% | 69% |

In accordance with Schedule C of PPUC's tariff schedule, there are three main components of the AFPAC (Fuel Rate) Computation:

- Component 1: Fuel price forecast based on inflation data
- Component 2: Quarterly adjustments based on actual fuel costs incurred and actual kilowatt hours billed to customers
- Component 3: Energy loss reduction adjustment based on PPUC's loss reduction targets



A detailed illustrative breakdown of these three technical components can be found on Appendix B, page 23.

VI. AUDIT METHODOLOGY

To accomplish our audit objective, we—

- interviewed PPUC management and officials,
- examined the PPUC's AFPAC tariff assessments and records maintained at the EPO Business Office,
- examined fuel, transportation and lubrication invoices, purchase orders, check payments, general ledger postings, disbursement records,
- reviewed Utility Star monthly billings reports,
- reviewed Board of Directors minutes and approval of new tariff rates,
- examined fuel contracts and conducted inquiries with certain fuel suppliers of PPUC,
- reviewed underlying data used by PPUC to compute inflation change quarter over quarter, confirmed certain pertinent information with independent third-parties,
- conducted discussions with outside experts in economics and oil industries,
- tested accuracy and completeness of fuel and related costs incurred during the audit scope,
- reviewed applicable policies, laws and regulations on PPUC tariff-setting process, including RPPL 9-54 creating Palau Energy Administration,
- conducted other audit-related procedures as necessary.

We conducted this performance audit in accordance with the Public Auditing Act and *Generally Accepted Government Auditing Standards* issued by the Comptroller General of the United States. 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 objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

VII. RESULT OF OUR AUDIT WORK

Audit Objective 1: Did PPUC have appropriate controls in place to ensure quarterly fuel tariffs (AFPAC) were computed properly and accurately?

Because fuel cost is one of the primary components in the AFPAC methodology, PPUC should have in place proper controls to ensure the accuracy of fuel purchases.

We performed our controls testing over accuracy, completeness and treatment of actual fuel purchases incurred during the period April 2014 through March 2016, which were actual fuel

costs reflected in utility rates in effect for periods October 2014 through September 2016. Fuel costs comprise of diesel fuel, generator fuel, lubricants, chemicals and related transportation of fuel to outlying islands of Peleliu, Angaur and Kayangel.

Because of its key significance to this audit, we reviewed all actual diesel fuel purchases incurred in the scope of our audit, totaling approximately \$28.2 million. Our review of these costs included reviewing controls over fuel requisitions, purchase orders and ensuring delivery and receipt of fuel to the respective power plant, and verifying that fuel payment was properly approved by appropriate signatory.

In addition to testing controls over the requisition and purchase of fuel, we also tested controls over the mathematical accuracy of data input of these fuel purchases into AFPAC worksheets that compute the quarterly cost of fuel for cost-recovery measures. We further tested controls, on a sampling basis, on lubrication purchases and transportation costs that are fuel-related costs.

| <i>Table II: Fuel purchases and related costs subject to internal control testing over requisition, purchases and data input into AFPAC worksheet</i> | | | |
|---|------------------------|----------------------------|---|
| Fuel Cost | Lubrication Oil | Transportation Cost | Total diesel fuel purchases and related costs: |
| \$28.2 M | \$430k | \$54k | \$29.17m |

Source: PPUC AFPAC Worksheet

Based on our testing, we did not find any material weaknesses or deficiencies in fuel purchases that would have had a material impact on the AFPAC rate calculations.

VIII. FINDINGS

Finding Number 1: *Secondary Review of AFPAC data inputs and worksheets*

Because the AFPAC methodology is data-intensive and data-sensitive and involves the manual transfer of data, proper review and reconciliation is critical to ensure the accuracy and completeness of data before, during and after data input into the AFPAC worksheet.

During our testing, we observed that only one individual was responsible for all data inputs into the AFPAC worksheet, which was an excel-based file heavily reliant on formulas and file-linking to compute quarterly electricity rates. After quarterly data input and computations were completed on the worksheet, it was provided to a senior management official for a high-level review, however, there was no evidence of secondary review or reconciliation to ensure that data input into excel worksheet was complete and accurate before the high-level review. We observed that total aggregate figures (such as monthly fuel purchases or monthly billings) were manually inputted into these Excel worksheets without a secondary review by another individual to verify the accuracy and completeness of such inputs or perform reconciliation procedures.

While we did not identify any material errors resulting from data input or proper reconciliation procedures, we took note that worksheets were complex, data-intensive, data-sensitive and perform a critical role in rate calculations the impact of which can be detrimental to PPUC and the public, if data input errors occur and are not detected and timely corrected.

Audit Recommendation 1:

We recommend that PPUC formulate a formal staffing structure that includes staff charged with secondary review and reconciliation procedures to ensure that AFPAC worksheets are properly reviewed and verified for accuracy and completeness by someone other than the person performing data inputs.

Furthermore, we recommend that PPUC formalized internal control procedures over data input, such as performing spot checks, batch totals, or other procedures to ensure that integrity of data is intact before, during and after manual data inputs. Lastly, we recommend PPUC to develop measures for cross-training its staff to ensure that such critical roles are not disrupted in the event that key personnel are placed on extended leave or leave the company.

PPUC's Response: We concur with the above findings. There was no such process or procedures in place prior to this audit. There is a Secondary Review in place now and PPUC will ensure the AFPAC calculations procedures are formalized and other personnel are trained to sufficiently provide secondary review when formulating the AFPAC.

Finding Number 2: Incomplete billing reports used and omission of subsequent billing adjustments on AFPAC rates

Because data used for the AFPAC Worksheets are extracted from the billings report and other source documents, it is extremely critical to have in place the proper controls to ensure that the reports contain all the essential data and that the reports are properly reviewed for completeness and accuracy before data input to the AFPAC Worksheet.

PPUC's Schedule C of the Tariff Schedule defining the AFPAC includes a significant component of fuel rate calculations based on actual kilowatt hours billed to customers, indicated by "Usage Kwh" column, on a system-generated report from PPUC's Utility Star billing system. At month end, these system-generated reports are extracted from the billing system and sent to one individual who manually inputs aggregate energy billing usage (in kilowatt hours) into AFPAC worksheets. Full reliance is placed on such reports without proper controls in place to ensure the completeness and accuracy of such reports, as disclosed in Finding 1.

During our audit, it was noted that such monthly billings figures inputted into AFPAC worksheets may be incomplete or inaccurate, as we noted several customers with zero (0) energy usage under the "Usage Kwh" column, but were billed for Energy and Fuel rate charge. This meant that customers had zero electricity consumption during the month but were charged a certain dollar amount for fuel and energy charges.

Table III below shows the total count of customers with zero energy consumption (Kwh) but who were billed for energy and fuel charge:

| <i>Table III: Inaccurate billing reports- Zero consumption</i> | | |
|--|---|---|
| | Number of Customer Accts. with Zero Energy Consumption | Total Aggregate \$/KWH Billed to these customers |
| FY 2015: | 146 Accounts | \$ 37,581 / 45,923 Kwh |
| FY 2016: | 92 Accounts | \$ 11,706 / 36,450 Kwh |

Source: PPUC Monthly Billing Reports for EPO Division

As such, we could not determine the current energy consumption for these customers, and thus, begs the question if these billings reports relied upon by PPUC were complete and accurate.

Additionally, upon reviewing PPUC's billings reports, we noted that each month when the system generates billings reports for all 7 cycles (*Cycle 1-3: Koror State; Cycle 4: Airai State & All States in Babeldoab; Cycle 5: Peleliu State; Cycle 6: Angaur State; and Cycle 7: Kayangel State*), the aggregate kilowatt hours billed to customers is inputted into the AFPAC worksheet and no other reports or data are used to "true-up" the actual hours billed and paid for by customers, in the event that customers receive subsequent billing adjustments for billing errors or for other causes.

By contrast, PPUC uses fuel inflation prices to project fuel prices and to recover actual fuel costs and, at the end of each quarter, the AFPAC computation is structured to "true-up" fuel costs to the actual amounts paid for by PPUC. This matching practice ensures that each quarter electricity rate reflect actual costs of fuel, however, we could not determine if this is true for billed kilowatt hours because aggregate billed consumption used in the AFPAC are essentially "gross" billings and do not reflect any subsequent billing adjustments, corrections, re-reads, or other adjustments to arrive at the true billed consumption that customers actually pay for. A 'true-up', in this case, would be utilized and reflected in the quarterly adjustments for kilowatt hours billed to true billings to actual amounts that were billed and paid for by customers.

Thus, AFPAC rates do not reflect any subsequent billings corrections or adjustments and, as such, if customers were overbilled for electricity in any given month and received subsequent adjustments in their accounts, such adjustment were not reflected in AFPAC rates.

Note: It is important to note that we did not perform any audit work to test IT application controls over PPUC's billing software, Utility Star. We also did not perform any test work to determine the impact of subsequent billing adjustments over the AFPAC rate.

Audit Recommendation 2:

We make the following recommendations to PPUC with respect to billings reports and billing adjustments:

- 1.) Establish internal control procedures to ensure that system-generated billings reports are properly reviewed and reconciled for completeness and accuracy and to document evidence that such reviews had been undertaken and completed before reports can be used for AFPAC computation purposes.

- 2.) Perform a thorough review of subsequent billings adjustments to determine if such amounts, both in consumption (kwh) and dollar value, are of a material amount that may impact AFPAC and, if so, formulate procedures and train personnel to include billings adjustments as part of preparing the AFPAC worksheets.

PPUC's Response: *We concur with the above findings except for matters discussed below. Specifically, we concur that the billing reports used did not include kWh usage of customers' last billing (disconnected accounts). PPUC has since corrected a billing-based system report that segregates kilowatts and gallons and includes all consumptions.*

- *Omission of subsequent billing adjustments: The correct kWh reading is recorded into customers' usage history that overrides the reading in error and the corrected calculated revenue is adjusted in the customers billing history. On the next billing run, usage (consumption) will be the difference between current kWh reading and the prior corrected kWh reading. This process ensures any adjustments to the kWh are captured on the next billing run.*

OPA's Comments: For customers that have been disconnected the Kwh usage should only be reported for the month in which the disconnection occurred; otherwise the Kwh usage can carry forward and appear on subsequent monthly billings reports distorting data transfer to the AFPAC Worksheet. In addition, if adjustments are made directly to the customer account without a defined report keeping track of them, then the adjustments would lack subsidiary support without the tedious and time-consuming effort of going through each individual customer account to verify the adjustments. .

- *Impact of the missing kWh:*
 - *FY2015 – 146 accounts with a total of 45,923kWh omitted has no impact on the AFPAC calculations for each of the quarters that we tested and recalculated*
 - *FY2016 – 92 accounts with a total of 36,450kWh omitted has no impact on the AFPAC calculations for each of the quarters that we tested and recalculated*

OPA's Comments: The issue is not whether the accounts have an impact on the AFPAC calculation but rather on reporting of the data that should be part of the AFPAC calculation, to support the integrity and credibility of the AFPAC Methodology. The AFPAC methodology requires certain data to calculate the electricity rate, which according to the formula should include the above accounts, whether they have an impact or not, which were missing from the AFPAC worksheet.

- *“True-Up” of the aggregate kilowatt hours billed inputted into AFPAC worksheet: Customers’ actual Billing Statement, Customers’ Usage History, Customers’ Bill History and Payment Posting Audit Report can be used to verify kWh on the AFPAC worksheet as well as payment receipts as they are system generated reports that is based on customers’ kWh usage (consumption) and payment received. PPUC will ensure internal control procedures are put in place to review the accuracy of such reports.*

OPA’s comments: This would work; however, in the interest of efficiency, there should be a summary report (reconciled to individual customer account) that can be used to verify or “true up” the aggregate kWh billed, rather than going through the tedious and time-consuming effort of verifying to each individual customer account.

Audit Objective 2: Did PPUC consistently and appropriately apply the fuel tariff (AFPAC) methodology put into effect in 2012?

Finding Number 3: Complex AFPAC Methodology

PPUC Board Resolution 2012-01, signed May 3, 2012, states that “PPUC [recognized] the need to revise its current tariff schedule and contracted with Palau Energy Office through a grant supplied by UNDP, to [engage] a consultant, Ridgway Capital Projects, Ltd., who completed its study early in 2010 and proposed revisions to the Electric Rates Schedule, and whereas the PPUC Board reviewed and approved, with condition, the proposed Schedule of Electric Rates designed based on the Ridgway study....”

The Office of the Public Auditor (OPA) performed a review of the PPUC’s Tariff Schedule (2012) and internal communications to gain a more in-depth understanding of the historical background of the approach PPUC has employed with respect to implementing the AFPAC.

We also reviewed in great detail the mentioned Ridgway consultant reports that served as a basis for the revision of PPUC’s Schedules of Electric Rates. In addition, the OPA reviewed the “Tariff Analysis Report” dated October 2012 by IT Power Australia commissioned for the Secretariat of the Pacific Community.

Tariff Structure

The Ridgway study proposed a tariff structure for PPUC as follows:

1.1 Overview

“The Total Tariff per kWh sold to each Customer Category shall be the total of Base Tariff and a Fuel Tariff.”

Total Tariff= Base Tariff + Fuel Tariff

The Base Tariff shall compensate PPUC for (a) its non-fuel costs of operation, (b) capital expenditures, (c) depreciation and (d) the estimated weighted average cost of capital employed by PPUC.

The Fuel Tariff shall compensate PPUC for the cost of fuel consumed by PPUC solely for the generation of electricity.

Our review of PPUC's Schedule of Electric Service Rates however revealed that although the PPUC adopted in general the Ridgway tariff methodologies, certain essential elements were either excluded or included (modifications) in the methodologies as shown in the comparative analysis below:

Ridgway: Base Tariff

"2.1 Overview - On the 1st January 2011 and on each anniversary of that date, the Base Tariff shall be updated for the following twelve month period. Two factors should be taken into consideration when updating the base tariff: inflation and efficiency gains."

"2.2 Inflation - As PPUC's costs rises so does the need for the base tariff to rise in line with these increased costs of operation. To compensate for these increased expenses, *the base tariff should be increased by an inflation factor determined by an independent third party.*"

"2.3 Efficiency - It is also possible that efficiency gains may be achieved by PPUC. If this is the case then the base tariff should decrease at the same rate as the overall efficiency gain."

Ridgway Base Tariff formula: Base Tariff = Base Tariff (previous year) x Inflation Factor x Efficiency Factor

PPUC: Base Tariff

Inflation - The PPUC's Base tariff does not factor in inflation, it has remained the same since 2012.

Efficiency - The PPUC has not implemented Efficiency rating factor in its calculation of Base Tariff.

PPUC's Base Tariff Formula: Base Tariff = Number of kilowatt-hours (kWh) billed x base charge rate per kWh.

Quarterly Fuel Tariff Adjustment Mechanism

The Ridgway Study recommended the following methodology with respect to fuel tariff adjustment:

“3.1 Overview: On 1st April 2010 and on each 1st July, 1st October, 1st January and 1st April thereafter, the Fuel Tariff shall be adjusted. The Fuel Tariff from the previous quarter shall be updated based on three factors; fuel price forecasts, fuel price history and a loss reduction program.

“3.2 Fuel Price Forecast: Whilst fuel prices are highly variable and hard to predict, PPUC must estimate the rate of increase that is likely to be witnessed each forthcoming quarter. Failure to do so will see insufficient revenues from the fuel tariff in the event of increasing fuel prices.”

The example used in the study follows: If the fuel tariff for Quarter 3 2010 was USD¢ 25.0 per kWh and PPUC believed that it was likely that the fuel bill for Quarter 4 2010 would rise by 2.5%, the fuel tariff would need to increase to USD¢ 25.63.

“3.3 Fuel Price History: As the previous quarter’s fuel tariff was based upon a forecast, an adjustment needs to be made to ensure that consumers are not paying more than necessary for fuel or alternatively that PPUC is not gathering sufficient revenue for fuel purchases.

In the instance that the forecasted fuel tariff for the previous quarter was more than necessary (i.e. the price of fuel did not rise to the extent forecasted) the following quarter’s fuel tariff needs to decrease so that this surplus is eroded.

In the instance that the forecasted fuel tariff for the previous quarter was less than necessary (i.e. the price of fuel rose higher than forecasted) the following quarter’s fuel tariff needs to increase so that this deficit is eroded.

The above fuel tariff adjustment mechanism proposed by the Ridgway study is simple and straightforward; however, the fuel tariff adjustment mechanism (AFPAC) devised and implemented by PPUC is complex and ambiguous for the following reasons:

- 1) PPUC lacks clear and defined guidelines on how to calculate the projected fuel price factor, which carries the most impact to change in electricity tariff and, thus; leaving this critical factor of the AFPAC to subjective treatment,
- 2) PPUC adopted in general the Ridgway’s Quarterly Fuel Tariff Adjustment Mechanism; however, it applied the methodology in an equation format that we did not find in the Ridgway Study. The way that each element in the methodology is structured in the equation can significantly affect the outcome of fuel rate calculations.
- 3) Because AFPAC methodology carries the most impact to any proposed change to electricity tariff, an industry expert should have reviewed and attested to the proposed

AFPAC formula and methodologies, the equation in particular, to ensure that it would accomplish its underlying purpose_ fuel cost recovery.

- 4) Although the AFPAC may operate to recover fuel costs for PPUC, it does not recover essential non-fuel costs of operations.

The OPA also reviewed the above-mentioned Tariff Analysis Report by IT Power Australia and includes the following excerpt:

Page 16 of the Report states: “it can be observed that the methodology is extremely complex and will be difficult to explain to householders and key stakeholders.”...

Audit Recommendation 3:

As fuel price projections (inflation) carry the most impact to changes in electricity tariff, we recommend that PPUC promulgate policies and procedures for projecting fuel prices.

We recommend PPUC to revisit the AFPAC Methodology by hiring an industry expert to study the AFPAC, the formula and equation in particular, to determine its applicability and appropriateness to its underlying purpose: fuel cost recovery.

We also recommend that PPUC further study and consider the application of the inflation factor to the base tariff as proposed in the Ridgway study. In this way, PPUC would have in place a mechanism to recapture essential non-fuel costs of operations on an annual basis. In doing so however, we concur with the Ridgway study that the inflation factor should be determined by an independent party, i.e. Palau Energy Administration.

Finally, we recommend that, pursuant to the Palau Energy Act of 2015, any future revisions to electricity tariffs or tariff formula shall be subject to review and comment by the Palau Energy Administration.

PPUC’s Response: *We disagree with the above findings. PPUC Board reserves the right to modify, revise and amend the Electric Rates Schedule as deemed necessary that would best benefit its customers. The adoption of the Electric Service Rates (Tariff) effective October 1, 2012 is an example of such.*

OPA’s Comments: The OPA does not in any way or form dispute the authority and power of the Board to set electric rates; however, Resolution No. 2012-01 recognized the need to revise the rates and the Board approved the proposed Electric Rates designed based on the Ridgway Study.

PPUC's Response: *There is no cost recovery on the Base Tariff as proposed by the Ridgeway consultants whereas the proposed Fuel Tariff methodology was approved and incorporated in the Electric Rates Schedule.*

OPA's Comments: The Ridgeway Report on page 2 clearly includes a mechanism for cost recovery on Base Tariff.

PPUC's Response: *Implementation of the Fuel Tariff methodology as proposed by the Ridgeway consultants is being implemented as is:*

- *Fuel Price Forecast – Inflation/Deflation Rate*
- *Fuel Price History – Recovery of prior quarter as based on actual fuel cost and actual kWh sales*
- *Loss Reduction Program*

OPA's Comments: The methodology implemented by the PPUC for fuel cost recovery contains the Ridgeway methodology but the PPUC implemented the methodology in an equation format for which we did not see in the Ridgeway Study. The format in which the elements in the formula are structured into the equation can significantly affect the outcome of fuel rate calculations.

Finding Number 4: *Inconsistent documentation of PPUC Management and Board approval of quarterly rates*

Section 13 of RPPL 4-13, which created PPUC, states in part, “All rates and regulations pertinent to the use of services shall be adopted by the Board of the P.U.C. only after public hearings following public notice published and posted as herein provided.”

During our review of the AFPAC rates effective for the period of the audit, we noted that three out of eight quarters tested were missing documented evidence of Board of Directors' (BOD) approval of management communication regarding rate increase and resulting BOD approval of those rates. In two of the quarters observed, the rates were postponed in lieu of the ROP national government subsidies, as evidenced by BODs' meeting minutes. However, in these instances, we noted that several versions of management communications to the Board were provided for our review, with no evidence clearly indicating the final version effective for the respective AFPAC quarter.

Upon further discussion with PPUC Business Manager, who is responsible for updating AFPAC quarterly worksheets, we observed that final approval from the BOD of rate changes each quarter is not always received timely, or in some cases, not received at all.

This is indicative that there are no formal protocol procedures for documenting chain of command approval, trail of documents evidencing approval and ensuring that such approval is received timely and filed accordingly, from the initial stage through final approval by the BOD.

Audit Recommendation 4:

We recommend PPUC to formulate formal protocol procedures for documenting actions requiring the BOD's approval, especially rate changes, that such procedures ensure the timeliness of actions taken and that actions are properly documented and filed.

PPUC's Response: We concur with the above findings. There was no such process or procedures in place prior to this audit. Although, there is already in place a proper documentation for the approval of quarterly rates by the Board. PPUC will ensure proper filing of documentation and copies disseminate to proper personnel.

Audit Objective 3: Did the AFPAC Rate methodology implemented to allow PPUC to recover its fuel costs operate as intended by law?

Finding Number 5: Weakness in self-regulating structure

RPPL 9-54, "Palau Energy Act", established the Energy Administration tasked with the responsibility to act as independent reviewer of PPUC's tariff formula and tariff rates computed and implemented by the PPUC.

Section 708 states, "(a) The Energy Administration shall develop guidelines under which will review PPUC's electricity tariffs and tariff formula. (b) PPUC will submit its proposed tariff schedule to the Energy Administration for review and comments. Concerns raised by the Energy Administration must be considered by PPUC in formulating its schedule."

We found that the Energy Administration has not developed guidelines for reviewing and commenting on PPUC's electricity tariff formula and tariff rates.

Thus, we found that during the latter part of 2016 covered in this audit, the AFPAC formula and tariff rates that were computed and put into effect by PPUC were not reviewed and commented by the Palau Energy Administration; thus, PPUC self-regulated its tariff formula and tariff rates.

Without an independent review of tariff formula and rates, the oversight controls intended by the Palau Energy Act are not operating as intended law; thus, if tariff formula or rates contain

improper elements or deficiencies, the resulting tariffs can have a detrimental impact on the social welfare and lives of citizens.

The lack of independent review as mandated by law was due to the lagging efforts to establish the Palau Energy Administration within the Ministry of Public Infrastructure, Industries and Commerce to oversee PPUC's tariff formula and tariff rates.

Audit Recommendation 5:

We recommend the Palau Energy Administration be established and to develop guidelines under which it will review and comment to proposed tariff formula and tariff rates proposed by PPUC in accordance with the law.

PPUC's Response: This applies to Palau Energy Administration.

Palau Energy Administration's Response: *The Palau Energy Administration is in the process of developing regulations and procedures specifically focusing on any proposed tariff rates and tariff formula that PPUC will use. These regulations will be finalized and shared with all parties.*

IX. SUMMARY

Appendix A: Illustrative Example of Audit Scope

Electricity rates that you see on your monthly PPUC bill:

| ELECTRICITY TARIFFS: | | | |
|-----------------------|---|--|---------|
| RESIDENTIAL: | | | |
| ELECTRIC RATE PER Kwh | | | |
| FROM 0-150 KWH | = | | \$0.152 |
| FROM 151-500 KWH | = | | \$0.226 |
| FROM 501 AND ABOVE | = | | \$0.275 |

Electricity rates made up of (1) Energy Rate and (2) Fuel Rate

| KWH Brackets | Energy | Fuel | Current Rate |
|---|--------|-------|--------------|
| Residential 0-150 | 0.02 | 0.132 | 15.2¢ |
| Residential 151-500 | 0.094 | 0.132 | 22.6¢ |
| Residential 501+ | 0.143 | 0.132 | 27.5¢ |
| Commercial/Government/ROP 0-150000 | 0.143 | 0.132 | 27.5¢ |
| Commercial/Government/ROP 150000-250000 | 0.133 | 0.132 | 26.5¢ |
| Commercial/Government/ROP 250000+ | 0.123 | 0.132 | 25.5¢ |

This performance audit specifically looked at the Fuel rate, specifically looking at 2 of 3 components of the fuel rate:

In-Scope:

- ➔ Component 1 of Fuel Rate:
Fuel price forecast based on inflation data
- ➔ Component 2 of Fuel Rate:
Quarterly adjustments based on actual fuel costs incurred and actual kilowatt hours billed to customers

Excluded from Scope:

- ➔ Component 3 of Fuel Rate:
Energy loss reduction adjustment based on PPUC's loss reduction targets
- ➔ Energy Rate

Appendix B: Detailed Illustrative breakdown of AFPAC Components

(A) Fuel price forecast:

Step 1: Obtain monthly inflation data per Singapore MOPS (Mean of Platts Singapore) data.

Step 2: Compute the *projected fuel price factor (inflation rate)* by change in fuel price quarter over quarter.

Step 3: Compute the *projected fuel price adjustment* by multiplying current effective fuel rate by the *projected fuel price factor (inflation rate)*.

(B) Prior Quarter Over (Under) Recovery:

Step 1: Current Recovery period: Actual Fuel Cost incurred / Actual Kwh Billed = Average Cost per Kwh (Current Recover period: 2 Quarters preceding effective date).

Step 2: Compute difference: Ave. Cost per Kwh (from 1) minus (-) Current Fuel Rate = Prior Quarter Fuel Price Adjustment

(C) Loss Reduction Program Adjustment:

Step 1: Compare estimated energy saved (Kwh) for next quarter against projected next quarter Kwh sold vs Table 1: Energy Loss Reduction Targets

Resulting formulate: Current effective rate + (A) + (B) + (C) = New effective AFPAC rate

KEY TERMS used:

| | |
|-----------------|--|
| AFPAC | Automatic Fuel Price Adjustment Clause |
| BOD | Board of Directors |
| EPO | Electrical Power Operations |
| KWH | Kilowatt Hour |
| MOPS | Mean of Platts Singapore |
| OPA | Office of the Public Auditor |
| PPUC | Palau Public Utilities Corporation |
| PEA | Palau Energy Administration |
| ROP | Republic of Palau |
| Tariff Schedule | Schedules of Electric Service Rates adopted by PPUC Board, effective October 1, 2012- Current date |
| WWO | Water and Wastewater Operations |



**ILLEGAL OR WASTEFUL ACTIVITIES
SHOULD BE REPORTED TO:**

**OFFICE OF THE PUBLIC AUDITOR
REPUBLIC OF PALAU
P. O. BOX 850
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**Ground Floor
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**MONDAY THRU FRIDAY
7:30 a.m. - 4:30 p.m.**

(Closed on Legal Holidays)