



U.S. DEPARTMENT OF THE INTERIOR
OFFICE OF INSPECTOR GENERAL

**ENERGY PRODUCTION
IN THE VIRGIN ISLANDS**

*Randolph Harley Power Plant
St. Thomas*



*Richmond Power Plant
St. Croix*





United States Department of the Interior

OFFICE OF INSPECTOR GENERAL
Washington, DC 20240

DEC 28 2009

The Honorable John P. deJongh, Jr.
Governor of the Virgin Islands
No. 21 Kongens Gade
St. Thomas, VI 00802

Re: Final Evaluation Report *Energy Production in the Virgin Islands*
(Report No. VI-EV-VIS-0002-2009)

Dear Governor deJongh:

This letter transmits the results of our evaluation of administrative functions related to energy production and costs in the Virgin Islands. We appreciate the cooperation shown by the Virgin Islands Water and Power Authority (WAPA) personnel during our review.

Prompted by a petition signed by over 700 WAPA power consumers, we sought to find out how the Levelized Energy Adjustment Clause (LEAC) rate, a cost of oil recovery fee, is applied and how contracts and credit cards are used. Our contract and credit card reviews uncovered no added costs to consumers. This report, therefore, focuses on the LEAC rate, its economic impact on power consumers, and the state of Virgin Islands energy production.

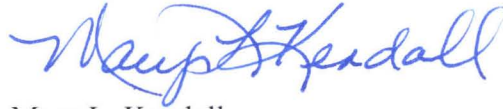
We found that WAPA regularly faces the dilemma of deciding whether cost efficient or reliable electric service should take precedence; it cannot deliver both. In fact, operators at WAPA's two power plants (one on St. Thomas and one on St. Croix) must make minute-by-minute decisions every day to avoid power interruptions. In its present state, WAPA is unable to provide power to consumers at a reasonable cost, and Virgin Islands power consumers are faced with the highest energy costs in the Nation.

Extraordinarily high energy costs result from a combination of factors; the Virgin Islands' total dependence on oil and the inefficiency of WAPA's power plants.

We provide four recommendations that, if implemented, should improve the efficiency of energy production and, thereby, reduce the costs that power consumers must pay. Please provide a response to this report by January 28, 2010 to our Caribbean Field Office, Ron deLugo Federal Building — Room 207, St. Thomas, VI 00802. Your response should identify plans to address the recommendations cited in this report.

If you have any questions concerning this report, you may contact me at (202) 208-5745 or Mr. Hannibal M. Ware, Assistant Regional Manager, at (340) 774-8300.

Sincerely,



Mary L. Kendall
Acting Inspector General

cc: Hugo V. Hodge, Jr., Executive Director, Water and Power Authority
Anthony Babauta, Assistant Secretary for Insular Affairs
Nikolao Pula, Deputy Assistant Secretary for Insular Affairs
David Hayes, Deputy Secretary, Office of the Secretary

WHY WE PERFORMED THIS EVALUATION

In January 2009, we received a petition claiming that WAPA had imposed “unbearable rate increases” on the people of the Virgin Islands. The over 700 petitioners requested that we review how the Virgin Islands Water and Power Authority (WAPA) recovers the cost of fuel from its customers — through the use of the Levelized Energy Adjustment Clause (LEAC) rate — and how it oversees contracting services, credit card usage, implementation of past audits, and consultant recommendations. Since then, we have been inundated with telephone requests for similar reviews.

OVERVIEW OF THE WATER AND POWER AUTHORITY

WAPA is an autonomous, quasi-governmental instrumentality of the Government of the Virgin Islands that produces and distributes electricity and potable water to approximately 54,113 electrical customers and 12,390 water customers. It is the only public source of electricity in the Virgin Islands.

The Virgin Islands is 100 percent dependent on oil to produce electricity. In comparison, only 1.6 percent of the electricity sold by stateside utilities is generated from oil. The second largest oil refinery in the western hemisphere (HOVENSA) is located in the Virgin Islands on the island of St. Croix. Agreements between the Government and HOVENSA and between HOVENSA and WAPA are designed to ensure that the Virgin Islands receive the best possible price for oil. Between 2002 and 2008, however, WAPA’s annual oil costs escalated from \$58.5 million to \$209.9 million due primarily to soaring worldwide oil prices.

The Public Services Commission (PSC), a regulatory agency, instituted the LEAC rate to be able to respond quickly to changes in fuel prices. WAPA petitions the PSC to set the LEAC rate WAPA may charge its customers for fuel and fuel-related costs. The rate is calculated by estimating the cost of fuel divided by revenues from electric consumers. As of October 2009, the LEAC rate is 22 cents per kilowatt hour. It was as high as 41 cents per kilowatt hour in September 2008.

WHAT WE FOUND

In the Virgin Islands, the provision of energy and water at a reasonable cost is a fundamental responsibility of the Government to its citizens. Virgin Islands citizens have a right to expect reliable electric service at the most affordable rate possible. WAPA, however, is currently unable to simultaneously provide cost efficient and reliable electric service to those citizens. In fact, Virgin Islands residents are being faced with extraordinarily high energy costs — the highest in the Nation.

Two factors contribute to such high costs: total dependence on oil to generate power and inefficient, outdated, and poorly maintained power plants. Unless the Virgin Islands moves quickly to develop all possible alternative energies and recognizes that updating and

maintaining WAPA's power plants is of the highest priority, power consumers will continue to endure unnecessarily high energy bills.

Oil Dependence Effect on LEAC Rates

WAPA's inability to implement alternative energy programs to alleviate its complete dependence on oil for energy generation has directly contributed to the critically high energy costs in the Virgin Islands today. As a result, WAPA is still subject to rapid changes in oil prices that are passed on to consumers in the form of the LEAC rate. This rate currently accounts for nearly 70 percent of consumers' bills. In fact, between 2002 and 2008, the LEAC rate continued to escalate (See Figure 1) until it represented over 80 percent of a consumer's total electric bill. That 80 percent translated to a cost of electricity that was almost 350 percent above the national average.

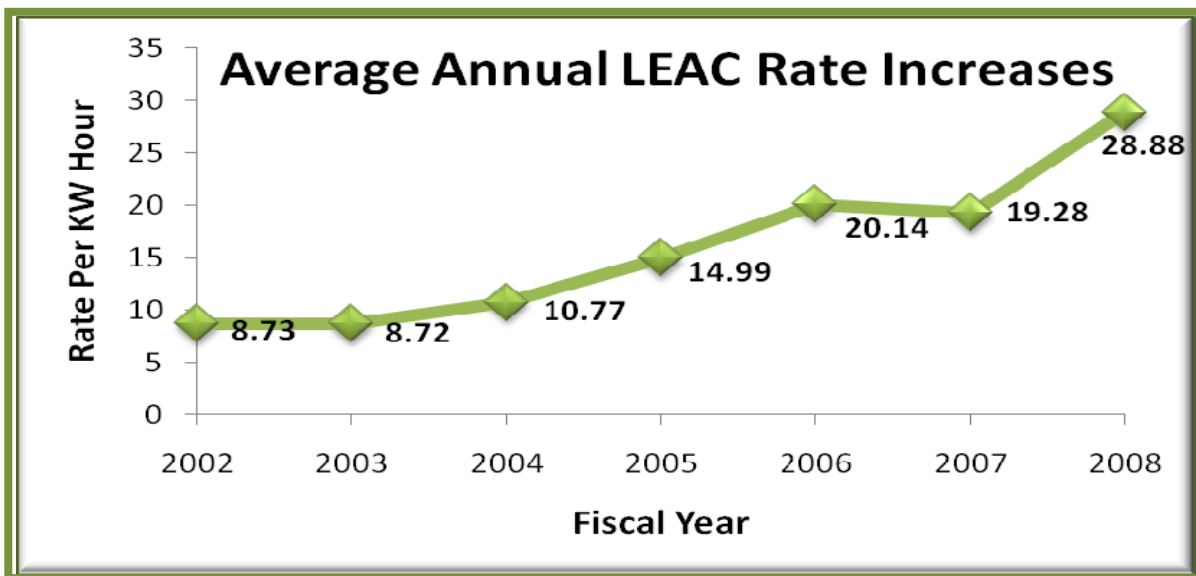


Figure 1. The LEAC rate drastically increased between 2002 and 2008

We believe that much of this escalation could have been curtailed had WAPA been successful in diversifying its power plants. Even in 2004 when the LEAC rate approached double digits and power consumers suffered huge increases in their electric bills, WAPA was unable to find a source of alternative energy to assist in providing permanent rate relief. Meanwhile, power consumers faced economic hardship, resulting in businesses that were forced to close, and families that were unable to afford their electric bills.

More recently, the Government and WAPA have acted more collaboratively on the need to develop alternative energies and to rectify the poor state of energy production in the Virgin Islands, as evidenced by the following actions.

- In August 2008, the Virgin Islands joined the International Partnership for Energy Development in Island Nations to further the use of energy-efficient and renewable energy technologies in island nations and territories.

- In June 2009, the Virgin Islands passed an energy bill to develop renewable and alternative energy and energy efficiency.
- In August 2009, WAPA entered into agreements to construct two trash-to-energy alternative energy power plants - one on St. Croix and one on St. Thomas. This has been projected to reduce WAPA's oil dependence by one-third.

While we commend these actions, we caution that they represent long-term solutions not expected to have an immediate impact on reducing the cost of electricity to WAPA power consumers. Several actions could be taken, however, to significantly affect WAPA's ability to provide more rapid economic relief in the short-term. These actions relate to addressing the inefficiency of WAPA's power plants.

Plant Efficiency Effect on LEAC Rates

Power production efficiency, the measure of how economically a power producer converts its fuel sources into electricity, is a major challenge for any electrical plant. In fact, it is one of the largest obstacles WAPA faces in lowering energy costs to consumers. While most national plants operate at 33 percent power production efficiency, WAPA operates at around 21 percent efficiency. This low level of efficiency means WAPA's plants must use a larger amount of fuel to meet demand than more efficient plants use to provide the same amount of electricity.

To illustrate, WAPA currently uses 2.4 million barrels of oil every year to generate power because of the inefficiency of its power plants. A net increase in power production efficiency of just 10 percent could result in LEAC savings to power consumers of \$18 million per year (based on the October 2009 per barrel oil price of \$75).

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One of the challenges facing WAPA in being more efficient is the fact that its power plants are island-based, with no large power grid or utility interconnections to back up its generating units. Moreover, the average age of all WAPA's generating units is 26 years, and in fact, some of the units are more than 40 years old. Many of those units have suffered large losses in net energy output and cost significantly more to operate than newer units.

Economic Dispatch

One way for WAPA to maximize the efficiency of its existing power plants would be to operate its generating units in a manner that would produce energy at the lowest cost to reliably serve consumers. This is known in the industry as the process of economic dispatch. WAPA currently applies economic dispatch either inconsistently or not at all.

Using economic dispatch, WAPA's most efficient generating units would be used to produce the normal amount of electricity required by

consumers during non-peak hours. WAPA's less efficient generating units would only be utilized when necessary to supplement the electricity generated by the more efficient units. This would lead to better fuel utilization and result in the purchase of less oil.

While WAPA's newer units operate at an efficiency rate of 23 percent, an older unit can operate at a rate as low as 13 percent. WAPA routinely uses its less efficient generating units to meet power demand and avoid recurring power outages because its newer units are not the most reliable and cannot handle the total load demand.

Heat Recovery System Generator

Increasing use of Heat Recovery System Generators (HRSGs) would also allow WAPA to improve the efficiency of its generating units and provide economic relief to rate-weary consumers. HRSGs are used to capture the steam produced when oil is burned to make electricity. The captured steam is then used in lieu of additional oil. Use of HRSGs allows WAPA to purchase less oil for which power consumers must pay.

WAPA has been trying to fund the purchase and installation of an HRSG for use on St. Croix since 2003. In 2007, Georgetown Consulting Group, a PSC consultant, wrote:

The HRSG addition [the proposed St. Croix generator] to WAPA's resource base is without question the single most important resource addition it [WAPA] can make in the near-term (18-months) to lower the cost to consumers. While WAPA continues to collaboratively work with the PSC staff, these additional delays will come at a considerable cost to consumers.

According to Georgetown, WAPA's failure to implement the HRSG project has had a staggering impact on consumers. They wrote that the delay has cost "\$22 million in price escalation; and more than \$25 million in lost fuel savings." As of April 2007, a total of roughly \$47 million could have been passed on to consumers in the form of lowered LEAC rates. As a result of such delays, funding issues, and prioritization problems, WAPA has been unable to complete the project in a timely manner and as of November 2009 the project was still not implemented.

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Maintenance

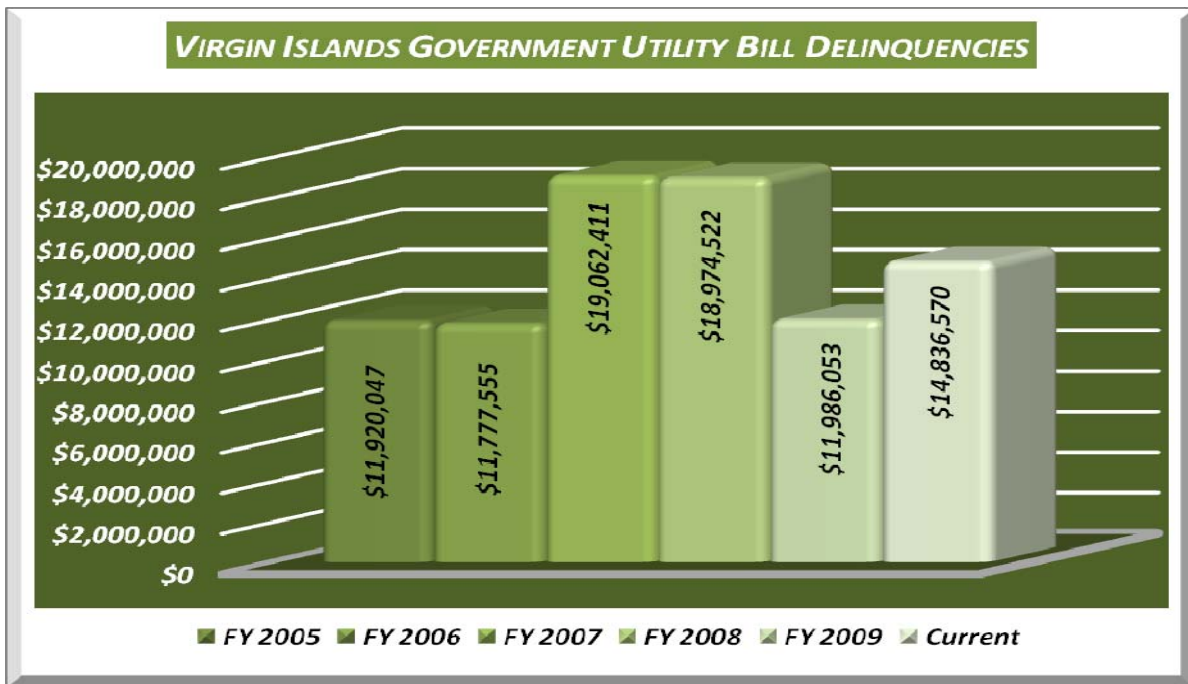
Another way for WAPA to maximize the efficiency of its existing generating units and reduce costs to consumers would be to implement and consistently follow a preventative maintenance schedule. Industry standards require that proper maintenance management be planned, scheduled, coordinated, and supported with appropriate resources to enhance plant performance and improve the

reliability of any power plant. WAPA has been unable to meet this standard. In fact, WAPA many times lacks the funds to follow factory maintenance timelines on its individual generating units.

Currently, WAPA uses approximately 80 percent of its annual operating revenues for fuel and fuel related costs. This leaves about 20 percent to fund personnel, maintenance and other expenses. By the time funds are available to perform maintenance, problems have often escalated, causing large increases in repair costs.

Further, WAPA’s maintenance budget has been consistently reduced over the years to offset rising fuel costs and the lack of positive cash flow. In fiscal year 2009, WAPA set aside only \$3.9 million for maintenance for the islands of St. Thomas and St. John. This amount is a far cry from what is realistically needed to maintain generating units as old as many of those WAPA runs. To illustrate, one generating unit recently was in need of service and the parts cost over \$4 million. This cost surpassed the entire year’s maintenance budget.

Chronic delinquency on the part of the Government in paying their utility bills further compromises WAPA’s ability to perform routine maintenance. In fact, the Virgin Islands Government owes WAPA tens of millions of dollars year after year in unpaid utility bills (See Figure 2). Today, the Government owes almost \$15 million to WAPA, despite having paid \$17 million towards outstanding bills in September 2008. Without a positive cash flow WAPA has little hope of improving and maintaining the efficiency of its plants.



**Figure 2. Combined balances: Owed by Central and Independent Government Agencies
WAPA’s Fiscal Year runs from July 1 to June 30**

The Government’s failure to pay its utility bills has created a domino effect that falls squarely on the shoulders of Virgin Islands power consumers. WAPA is unable to adequately maintain

its generating units; units become more inefficient and require much more fuel to produce power; and the LEAC rate increases (See Figure 3).



Figure 3. Domino Effect of Virgin Islands Government Utility Bill Delinquencies

Conclusion

The issues facing WAPA in its ability to provide efficient service at a reasonable cost are not easily rectifiable. As illustrated throughout this report, WAPA is faced with limited financial resources that create major obstacles to their efforts to diversify its power production plants. WAPA should, however, make every effort to immediately prioritize the items concerning increasing the efficiency of its existing plants to reduce its current oil consumption. Any increase in the level of efficiency at WAPA's power plants will result in a direct reduction in the LEAC rate and economic relief for power consumers in the Virgin Islands.

Recommendations

To ensure the cost effectiveness of power production to Virgin Islands power consumers, we recommend that the Governor of the Virgin Islands:

1. Continue to seek alternative fuel sources to diversify energy production in the Virgin Islands.
2. Pursue funding to assist WAPA in modernizing or replacing inefficient generating units and support WAPA's aggressive pursuit of available funding to diversify its power plants.
3. Ensure that WAPA:
 - a. Adequately maintains and repairs its existing generating units, so that economic dispatch can be practiced and use of inefficient generating units can be decreased.

- b. Immediately completes installation of and utilizes the HRSG on St. Croix.
 - c. Implements a policy of consistent use of economic dispatch.
4. Establish a bill-paying policy to ensure that all delinquent utility bills owed WAPA are paid as soon as possible and that the Government and its instrumentalities pay WAPA's monthly utility bills on a priority basis.

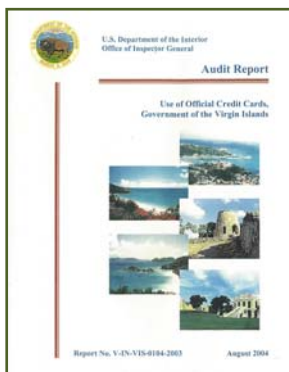
EVALUATION SCOPE, METHODOLOGY, AND PRIOR COVERAGE

The objective of our evaluation was to determine whether WAPA and its Governing Board carried out its administrative functions efficiently, including administering the LEAC rate and overseeing contracts and credit card usage.

We performed our work from March 2009 to September 2009 in accordance with the “Quality Standards for Inspections” issued by the President’s Council on Integrity and Efficiency. To accomplish our objective, we interviewed WAPA officials and engineers, and reviewed LEAC filings and corresponding orders, contracting files, credit card records, consultants’ reports and studies, as well as government accounts receivable records. We also consulted with industry experts and reviewed industry standards.

The results of the LEAC rate review are fully disclosed throughout the body of this report. The administrative reviews on contracts and credit card usage disclosed only minor discrepancies that did not impact the LEAC rate, and therefore, did not result in any cost to the consumers. Specifically, we reviewed 20 professional service and construction contracts worth \$12 million, and 846 credit card transactions worth in excess of \$400,000.

Prior Coverage



The Office of Inspector General has not conducted any specific audits of WAPA in the past 10 years. However, we did conduct a Government-wide audit of the use of official credit cards and issued a report in August 2004. In that audit we found 16 WAPA cardholders had personal charges of more than \$59,000. Although WAPA did not pay for any of the personal purchases, the use of official credit cards for those purchases adversely affected WAPA when the credit card company canceled five of the cards because of nonpayment and delinquency.

MONETARY IMPACT

POTENTIAL LEAC RATE COST SAVINGS	
FUNDS TO BE PUT TO BETTER USE	
OVERALL INCREASE IN EFFICIENCY	\$18,000,000
UNTIMELY IMPLEMENTATION OF HRSG	\$47,000,000
TOTAL	<u>\$65,000,000</u>

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