



VIRGIN ISLANDS
WATER AND POWER AUTHORITY
OFFICE OF THE EXECUTIVE DIRECTOR

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September 3, 2024

The Honorable
Milton E. Potter
Capitol Building, Charlotte Amalie
P.O. Box 1690
St. Thomas, VI 00804

Dear Chairman Potter:

I am writing to submit testimony for the upcoming Committee on Disaster Recovery, Infrastructure and Planning Hearing scheduled for Thursday.

Water Distribution Infrastructure:

Many of the distribution lines, which are between 40 and 60 years old, continue to deteriorate, contributing to ongoing water quality and line loss issues across both districts. WAPA has undertaken several modernization efforts with the support of federal funding, such as EPA grants, and has seen positive results in areas where water infrastructure projects have been completed.

Electric Systems:

The electrical grid remains significantly challenged following the unprecedented damage from Hurricanes Irma and Maria in 2017. Critical infrastructure, including transformers, generating units, and substations, has been severely compromised, resulting in an increased risk of service interruptions and outages.

Long-Term Infrastructure Plans:

We are building a more resilient power and water system for the Virgin Islands. This includes ongoing and upcoming projects to modernize our aging infrastructure, expand our capacity, and integrate renewable energy sources.

Enclosed with this letter, please find my detailed testimony on WAPA's comprehensive updates for disaster recovery and infrastructure improvement. We appreciate the opportunity to present this information and myself and my team look forward to discussing these important issues during the hearing in person. Kindly note that a virtual link will be necessary to accommodate the participation of certain team members who will join remotely.

Respectfully,

Karl Knight
Chief Executive Officer/Executive Director
Virgin Islands Water and Power Authority

Testimony to the 35th Legislature | Committee on Disaster Recovery, Infrastructure and Planning

Good afternoon, Chairman Milton Potter and all other honorable members of the Senate. I am Karl Knight, Chief Executive Officer and Executive Director of the Virgin Islands Water and Power Authority. I extend greetings to the broader community and the dedicated employees of the Water and Power Authority, who are listening and viewing today.

Mr. Chair, at your invitation, I am here to discuss the Virgin Islands Water and Power Authority's planned, in process, and completed projects; the status of all federal and local funding identified for WAPA's projects, as well as any impediments with respect to the Authority's role in the territory's disaster recovery efforts.

Electric Systems Infrastructure

WAPA oversees two separate power grids for the St. Thomas/St. John and St. Croix districts, each featuring independent power plants, extensive overhead, underground, and subsea transmission and distribution infrastructure. Prior to the 2017 hurricanes, the power grids were equipped with robust N-1 redundancy systems, allowing backup infrastructure to sustain operations in the event of a single failure event, such as the unplanned loss of a transmission line, generator or transformer. However, Hurricanes Irma and Maria caused unprecedented damage to the grid, with high winds and flooding impacting transmission lines, generating units, and substations, rendering critical components inoperable.

The failure of these key assets has led to systemic challenges and cascading failures that have greatly reduced the power system's resilience. Consequently, our customers are now more vulnerable to rotating power outages and extended periods without electricity. Specific district-level failures include multiple inoperable units and transmission lines, damaged substations, and compromised submarine cables:

St. Thomas/St. John District

Randolph Harley Power Plant

- Gas Turbine 14 is inoperable

Transmission & Distribution

- Transmission Line Feeder 11 is inoperable.
- Donald Francois Substation
 - Several breaker cubicles are damaged and inoperable.



- East End Substation
 - The power transformer connecting transmission and distribution assets is inoperable.
- Submarine Cables
 - One of the two transmission lines to St. John is inoperable.
 - The distribution line to St. John is inoperable.

St. Croix District

Estate Richmond Power Plant

- A power transformer at the Estate Richmond Power Plant, which connects generation, transmission, and distribution assets, is inoperable.
- Steam Turbines 10 & 11 and Gas Turbine 16 are inoperable

The situation is exacerbated by lengthy lead times and high costs for component replacements, combined with the Authority's limited financial resources. Many of our legacy generating units have exceeded their expected lifespan, with several overdue for maintenance or major overhauls. Preventative maintenance activities are often delayed due to shortages of manpower, training, and equipment, further compromising system reliability. Several units have not received major overhauls in over twelve years, resulting in diminished performance and reduced capacity.

Water Distribution Infrastructure

Discolored water is still a concern in certain areas of the territory's potable water distribution system due to the old infrastructure. While recent adjustments to the water production post-treatment system have improved water clarity in St. Croix, the primary issue remains the age of the system. Our water distribution network, made up of cast iron and ductile iron pipes that are 40 to 60 years old, has deteriorated over time, contributing to the problem of discolored water and increased line losses in both districts.

The Virgin Islands Water and Power Authority has made strides in modernizing sections of its water infrastructure, made possible solely by the grants from the Environmental Protection Agency (EPA). Completed waterline rehabilitation projects in Christiansted, Frederiksted, and Clifton Hill have improved water service in those areas on St. Croix. While projects in Campo Rico and Hannah's Rest are nearing completion, at 95% and 75% respectively. On St. Thomas, projects at Mahogany Estate and Blackbeard Hill are pending environmental and historic preservation reviews by the Department of Planning and Natural Resources (DPNR).



Federal funding, particularly from the American Rescue Plan Act (ARPA), is supporting additional infrastructure improvements. ARPA funds have been allocated to extend water service to Estate Nazareth and support two large-scale utility coordination projects: the 30-mile Northside Road Rehabilitation project and the 5-mile Anna's Retreat Phase 2 expansion project, both of which are currently in the planning and design phases.

Long-Term Infrastructure Plans for WAPA - Electric

WAPA is actively pursuing long-term infrastructure improvements through funding from FEMA and the Department of Housing and Urban Development (HUD), including Community Development Block Grants for Disaster Recovery (CDBG-DR) and Mitigation (MIT). These initiatives focus on enhancing the power system's resilience and reliability, addressing critical areas in generation, transmission, and distribution.

Composite Pole Installation: To address vulnerabilities, we are installing composite poles across the Territory, particularly where undergrounding is not feasible. These poles are designed to withstand severe weather conditions.

- St. Croix: Phase 1 is 98% complete with 4,028 poles installed, with Phase 2 beginning in October 2024 for an additional 1,130 pole to be installed by August 2026.
- St. Thomas: Phase 1 is completed with 2,334 poles installed, with Phase 2 being 36% completed and anticipated to be fully installed by January 2026.
- Territory-wide installation is 80% complete.

Undergrounding Projects: We are implementing underground projects on main feeders and transmission lines to protect critical infrastructure. These projects are designed to strengthen our infrastructure and improve service reliability for our customers in the coming year.

- Completed projects include Midland, Golden Grove, and Container Port on St. Croix, and Cruz Bay Feeder 7E on St. John.
- Upcoming Projects for 2024 on St. Thomas, we will be focusing on improvements to Feeder 5A and Feeder 9A. Meanwhile, on St. Croix, our efforts will target enhancements in the Hannah's Rest and Queen Mary areas.

Substation Replacements and Upgrades: Replacing and upgrading switchgear and associated electrical equipment damaged by Hurricanes Irma and Maria and constructing buildings that will help mitigate the impact of hurricane winds.



- Current projects include the East End Substation 34.5kV and 15kV Switchgear Replacement Projects and the Donald Francois Substation Switchgear Replacement Project.
- The 34.5KV Switchgear Replacement was completed in July 2020.
- Upcoming projects are the Tutu and St. John Substations.

Transformer Replacements: As part of our infrastructure enhancement efforts, we are replacing aging transformers on all three islands—St. Thomas, St. John, and St. Croix. These replacements are crucial for ensuring the stability and efficiency of our power distribution network, reducing the risk of outages, and improving overall system performance.

- The St. John ET2 transformer replacement was completed in July 2022.
- The active East End Transformer replacement project is expected to be completed in 2026.

Microgrid Installations: We are deploying microgrids and battery storage systems to enhance localized power generation and stability during outages. Key microgrid locations include Coral Bay and Cruz Bay on St. John, the Bovoni site on St. Thomas, and the Adventure site on St. Croix.

Battery Storage Systems: Battery storage is a cornerstone of our infrastructure plan. These systems will store energy generated from renewable sources and provide backup power during peak demand or emergencies, enhancing grid stability across the Territory. These additional systems will be located at the Richmond Plant and the multiple substations throughout the St. Thomas district.

Submarine Cable Replacement: Projects include replacing and installing submarine cables between islands to ensure reliable power transmission.

Generation Projects: Key initiatives include replacing aging units and modernizing the Richmond and Randolph Harley Power Plants with support from FEMA's BBA Prudent Replacement program. It is critical that the installation of generation capacity meets the specific needs of each island. The Authority, in collaboration with its federal partners, is ensuring that the power generation infrastructure is tailored to address the unique demands of St. Thomas, St. John, and St. Croix.

Advanced Metering Infrastructure (AMI) System Replacement: A territory-wide

replacement of the AMI system is planned to improve customer service and energy management. The Request for Proposal (RFP) is scheduled to be released in October 2024.

These critical infrastructure projects—ranging from transformer replacements, microgrids, undergrounding, and composite pole installations to generation upgrades and submarine cable replacements—are essential for strengthening WAPA's overall infrastructure and ensuring a more resilient power system for the Virgin Islands.

Long-Term Infrastructure Plans for WAPA - Water

Funding for long-term water system infrastructure improvements is provided by FEMA Prudent Replacement Public Assistance which will replace and modernize the piping network to best-in-class standards. FEMA has approved a fixed cost offer for St. Croix of \$1.29 billion. The fixed cost offer has been submitted to the Army Corps of Engineers for review; and final approval is expected in October 2024. The first bundle of projects under the super PMO is expected to be advertised for bids in fall 2024. Upwards of 90% of the water pipes, some water storage tanks, and pump stations will be replaced or upgraded as part of the prudent replacement plan.

A FEMA fixed cost offer approval for the St. Thomas-St. John district is expected by mid-September 2024; and final approval is projected for January 2025.

Wärtsilä Restart Project Status

The commissioning and construction team mobilized on July 15, 2024, following the successful negotiation and payment of change orders. The Battery Energy Storage System (BESS) was commissioned and operational by August 17, 2024. Commissioning of dual-fuel engines began on July 18, 2024. We have completed the first phase of reliability testing, with additional LFO testing expected to be finalized by the second week of September.

The temporary LPG installation is complete, and pre-commissioning activities are scheduled to begin the week of September 14, 2024. The Authority is working diligently with Wärtsilä to have substantial completion and engine operations by December 2024 and final completion by or before February 2025.

During this period, the Authority has observed the positive impact of the BESS in operations, particularly during Tropical Storm Ernesto, and the engines have been successfully online multiple times during commissioning to assist the Authority.



The Status of All Critical Vendor Payments

The Authority accounts payable in the table below shows the balances owed to vendors as of August 2024:

<u>Accounts Payable Owed to Vendors:</u>	<u># Vendors</u>	<u>\$ (millions)</u>
Top 25	25	\$ 147.0
All Other	187	\$ 17.9
Vendors less than \$10K	2,544	\$ 1.4
Total	2,756	\$ 166.3

As shown above, the Authority owes approximately \$147 million to its top 25 vendors. Approximately 2,500 vendors are owed less than \$10K and total approximately \$1.4 million. All other vendors are owed a total of approximately \$17.9 million.

The top 25 balances include amounts owed to vendors who provide fuel, electric and water generation services, and Operations & Maintenance (O&M) services. The payments the Authority receives from customers do not fully cover the cost of the services provided, leading to a cash shortfall. As such, the Authority is past due on payments for both critical and non-critical vendors. Fuel is the largest cost and thus the most critical vendor. The Authority paid approximately 55% of FY 2024 operating expenses to fuel costs.

Fuel Status Update

The Authority is proactively working to reduce its reliance on fossil fuels by integrating renewable energy sources and transitioning to more efficient generation assets. The Richmond Power Plant can operate its generating units entirely on liquefied petroleum gas (LPG) to meet customer demand, with diesel used sparingly for start-up and maintenance purposes. Conversely, the Randolph Harley Power Plant does not primarily use LPG. Until the Wartsila units are fully commissioned, Randolph Harley remains dependent on diesel to operate its gas turbines, currently running at a mix of 60% LPG and 40% diesel.

To ensure reliable service, the Authority strives to maintain a minimum of six days' worth of fuel supply for both LPG and diesel at its power plants. As of August 30, 2024, the Randolph Harley Power Plant has 12 days of LPG and 4 days of diesel, while the Estate Richmond Power Plant has 8.9 days of LPG and 2 days of diesel. We are negotiating long-term fuel supply solutions to reduce costs and ensure adequate reserves.



LPG 9-Month Term Agreement

During the initial 60-day period, the incident command structure successfully negotiated a reduction in the LPG transportation rate to the territory. Under a 9-month agreement with Vitol, the transportation rate was decreased from \$0.73 per gallon to \$0.59 per gallon, resulting in approximately \$1.9 million in savings to date, based on current consumption levels of about 160,000 barrels of LPG per month.

Further cost savings are anticipated under this agreement when the Wartsila Phase Two generators become operational at the end of the year, potentially increasing monthly LPG consumption to 180,000 barrels. Under the 9-month term, this increase could lower the transportation rate from \$0.59 to \$0.55 per gallon.

The Authority is also engaging a fuel expert under a professional services agreement to explore long-term fuel supply solutions. It is expected that, upon completion of the 9-month term, the Authority will be able to negotiate a bulk LPG transportation rate of \$0.40 per gallon or lower.

Diesel

The Authority currently receives bulk diesel supply via waterborne cargo under a contract with Borinken Towing & Salvage, which expires at the end of this year. Over the next three months, the Authority will review its long-term diesel supply needs and will solicit bids for a new diesel supply contract through a competitive bidding process.

The Status of the Turnaround Company Initiative

On August 20, 2021, Act No. 8471, Section 6, was enacted, mandating that the Authority promptly retain, assess, and implement the recommendations of a private turnaround management company. However, despite this directive, the required funds were beyond the Authority's reach. Compliance with this mandate would have necessitated diverting critical resources from essential needs such as fuel procurement, hurricane safeguards, and existing operating expenses.

Recognizing these constraints, the Legislature took further action on April 20, 2023, by enacting Act 8701, which required the Government to engage the services of the turnaround management company. Following this, the Public Finance Authority (PFA) conducted a public bidding process and selected Ernst & Young (EY).

We understand that the PFA and EY are currently working expeditiously towards finalizing an agreement. In the meantime, the Authority and the PFA have settled on terms through a Memorandum of Understanding (MOU) to provide access to the necessary information held by WAPA. The Authority welcomes the pragmatic retention of experts to review, assess, and provide recommendations for improving our systems and operations.

In conclusion, these infrastructure initiatives are vital to enhancing WAPA's resilience and ensuring reliable water and power services for the Virgin Islands. Our dedication to these improvements reflects our pride in striving to serve our community with compassion and excellence. We will persist in our collaboration with federal partners and local stakeholders to achieve these objectives and with this body's support, we will achieve our goals together.

Thank you for your time and attention to these essential matters. I stand ready alongside my team present to address any questions you may have.

Appendix A – Electrical Projects:

<https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:78dfbe03-c751-45fb-855d-22e216f0e9de>

Appendix B – Water Projects:

<https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:68029d1c-3ec3-414b-a0a1-b604c9ed940d>

