



JULIO A. RHYMER, SR.
EXECUTIVE DIRECTOR/CEO
VIRGIN ISLANDS WATER and POWER AUTHORITY

**STATEMENT BEFORE THE
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON ENERGY
UNITED STATES CONGRESS**

HEARING ON

***The 2017 Hurricane Season: A Review of Emergency Response & Energy
Infrastructure Recovery Efforts
As a result of the Recent Hurricanes***

NOVEMBER 2, 2017

Good day Chairman Upton, Ranking Member Rush, and other Honorable members of the Subcommittee on Energy. My name is Julio A. Rhymer, Sr. I am the Executive Director/Chief Executive Officer of the Virgin Islands Water and Power Authority (“V.I. WAPA,” “WAPA,” or the “Authority”). On behalf of the Governor of the Virgin Islands, the Honorable Kenneth E. Mapp, the Virgin Islands Delegate to Congress, the Honorable Stacey Plaskett, the members of the 32nd Legislature of the Virgin Islands, and the Governing Board of the WAPA, I thank you for the invitation to provide testimony on the energy challenges facing the Virgin Islands as a result of the passage of Hurricanes Irma and Maria on September 6, 2017 and September 19, 2017, respectively.

SECTION 1. INTRODUCTION

Hurricanes are not an unusual occurrence in the Caribbean where the Atlantic Hurricane Season runs from June 1st to November 30th, with the peak period from early August through the

end of October. Based on historical weather records dating back to the 1950s, the Atlantic region typically experiences 12 tropical storms with sustained winds of 39 mph, of which six turn into hurricanes, with winds reaching 74 mph or greater, and three develop into major hurricanes, Category 3 or higher, with sustained winds of at least 111 mph. It is important to note that most of these hurricanes do not make landfall in the U.S. Virgin Islands, and that a hurricane passes near the U.S. Virgin Islands, on average, every three years, and makes a direct hit on the islands, on average, every eight years.

As all of you are aware, in September of 2017, the Virgin Islands faced the phenomenon of two back to back category five hurricanes. According to the Saffir-Simpson Wind Scale that is used by the National Hurricane Center to classify hurricanes based on wind speed, a Category Five hurricane has sustained winds greater than 156 mph.

SECTION 2 – OVERVIEW OF THE HOW THE AUTHORITY OPERATES

Before I tell you about the devastating impact the hurricanes have had on the utility, allow me to provide you a brief overview of how electrical service is provided to the businesses and resident of our community. Like most other Caribbean islands, the USVI has no conventional energy resources to meet its power needs. While U.S. mainland utilities can connect to grids to purchase power from other utilities in the continental United States, island utilities such as V.I. WAPA are small, isolated and do not benefit from being interconnected to a grid comprised of other utilities. The separation of the islands by water, coupled by the depth of the ocean floor also makes interconnection via submarine cables both technically and financially prohibitive. To maximize the benefit of market conditions, island utilities have historically purchased small simple-cycle, oil-fueled, generating units. From the 1980s to approximately

September of 2003, the inflation-adjusted price of a barrel of crude oil on the NYMEX was generally under \$25/barrel. The attraction of such low-cost fuel, combined with the economies of scale, provided the framework for island utilities, like WAPA, to purchase these oil powered units.

As a result of the Virgin Islands being comprised of several small islands separated by water, duplicate generation systems and increased reserves are required to meet the demand for electrical services. V.I. WAPA, for example, has two independent generation systems. One system, located on St. Thomas, serves the islands of St. Thomas, St. John, Water Island, and Hassel Island, and the other is located on St. Croix. Our two power plants sit more than 40 miles apart and are not interconnected due to the depth of the ocean floor.

In recent years, WAPA has met some success in the diversification of 100% reliance on fossil fuel. We have implemented up 15 MW of Net Metering, and through public/private partnerships we have added approximately 8.2 MW of solar power to our electric grid. Through these initiatives, WAPA now has the capability to derive up to 20% of its generation capacity from renewables.

In yet another effort to reduce our reliance on fuel oil, WAPA partnered with VITOL Group, a multi-national energy and commodity trading company, to construct and operate Liquefied Petroleum Gas (LPG) terminals, supply LPG and manage the conversion of WAPA's gas units. Several of WAPA's generators are now tri-fuel capable, and can be fueled by oil, LPG, or natural gas.

In March of this year, WAPA contracted with Wartsila North America, to provide the first new generation for the Authority's operation in over a decade. The three new generators, at 7 MW each, will burn LPG to produce electrical power. The units were expected on island by the end of this year, with completion in the first quarter of 2018; however, due to the hurricanes, there will be a slight delay. The move to smaller units emerged from an Integrated Resource Plan developed for WAPA to provide a roadmap for future generation needs. The grant, for \$500,000, was funded by the Department of Interior.

Utilizing FEMA hazard litigation grants, limited portions of the utility's electric power transmission and distribution ("T&D") systems have been placed underground. Critical infrastructure such as the territory's hospitals, airports, and approximately 75% of the main business districts are underground. After Hurricanes Irma and Maria, those facilities were among the first to be restored. The remainder of the T&D system is comprised largely of aerial circuits suspended by wooden poles. While this has been the lowest cost method of developing a T&D system, it is also the most vulnerable in windstorms.

SECTION 3: IMPACT OF THE STORMS

While our power generating plants in Estate Richmond on St. Croix and Krum Bay on St. Thomas suffered minimal impact from the hurricanes, the transmission and distribution systems did not fare as well. Damage to the systems was estimated at 80% on St. Thomas and more than 90% on St. John, with Water Island and Hassel Island each suffering approximately 90% destruction. Following the passage of Hurricane Irma on September 6, WAPA, utilizing its own line department personnel along with on-island contractors, engaged a Territory-wide reconstruction and restoration effort. Two weeks later, on September 19, Hurricane Maria left

about 60% damage to St. Croix's T&D system, while the remainder of the Virgin Islands did not receive any further damage.

In our ongoing recovery efforts following the hurricanes, WAPA continues to address the five (5) critical areas necessary to rebuild our electrical system. These are: equipment, materials and supplies, funding for operations, emergency restoration crews and housing for crews. There are presently in excess of 520 off-island linemen in the Virgin Islands restoring our T&D systems, beginning with the primary circuits. Their work will end when every residential area of our territory has been energized. These crews, which typically consist of six individuals, are being provided primarily by Haugland Energy Group, LLC, BBC Electrical Services, and utilities from the North East Public Power Association. With the assistance of FEMA, a contracted cruise ship have been brought into the territory to provide sleeping quarters for off-island personnel, since many hotels and guest houses throughout the territory closed after sustaining major damages to their infrastructure during the two hurricanes.

Bringing vehicles, materials, and equipment has also been a challenge. Because of our unique geographical location, surrounded by water, V.I. WAPA cannot truck materials and supplies to the islands, and air travel cannot readily supply the large quantities of these items needed. Almost all needed vehicles, equipment, and supplies that cannot be sourced on-island are shipped in via cargo shipping, which, as you can imagine, competes for space with all other government agencies, businesses, and individuals that are shipping cargo with relief materials to the Virgin Islands. In terms of materials, large quantities of poles, conductors, insulators, single-phase and three-phase transformers are being ordered to build and repair overhead sub-transmission (35 kV) circuits, build and repair three-phase main distribution feeder lines (15kV

and 25kV) along the Authority's feeder routes, build and repair three-phase and single-phase laterals along existing distribution routes, install and replace pole-mounted distribution transformers up to 75 kVA on 15kV and 25 kV distribution systems, and install and repair secondary conductors to customer service drop locations. The current focus is on restoring overhead transmission feeders and main distribution feeder trunks.

To restore the transmission and distribution system, the Authority will require additional equipment, including pole trucks, bucket trucks, and digger derricks, along with other vehicles such as trucks and sport utility vehicles. The purpose of the pole trucks in the current restoration is to transport poles to the specific sites for replacement. Pole trucks will be deployed with each crew in order to assist with the restoration process. Bucket trucks will be used to string lines, dress poles, and service lines to customer locations. These are essential pieces of equipment for the entire restoration. Digger derricks will be used to dig holes for the new poles to be planted. The additional vehicles such as pick-up trucks and sport utility vehicles will be used to transport crews, support personnel, and additional supplies not housed on the other pieces of equipment. These vehicles will also be used to survey and assess damages for all sectors of the transmission and distribution system.

By far, the biggest challenges, and the ones I would like to focus on today, are the funding for day-to-day operations, as well as hardening of the system in the event of future storms. The hurricanes, it goes without saying, have decimated the finances of WAPA. It is a significant hardship for the utility to operate and pay for day to day expenses, much less these extraordinary expenses that accompanies the restoration efforts. We wish to thank the Congress the Senate and the Honorable President Donald L. Trump for passing speedy relief in the form of

a \$36.5 billion aid measure that would help the Virgin Islands and Puerto Rico restore our infrastructure.

While we appreciate the assistance that has and will be forthcoming to rebuild the systems that were damaged, our primary concerns with the Authority's operation is our ability to meet our pre-existing expenses. Prior to the hurricanes, the Authority's revenues were, on average, \$26.5 million per month. After the hurricanes and the destruction of the T&D systems, and since we cannot bill customers, our revenues have dipped to below \$2 million per month. The V.I. Water and Power Authority has recurring expenses such as payroll, insurance, operation and maintenance of the plants, debt service, previously executed contracts, as well as financing agreements we must pay. To address these expenses, the Authority through the Government of the U.S. Virgin Islands, has sought a Community Disaster Loan. Any support or assistance that you can offer in this regard is appreciated.

One of the evident takeaways from having to rebuild the T&D systems four times within the last three decades is an urgent need for WAPA to not just rebuild our transmission and distribution system to what it was before the storm, but to harden or otherwise make it impervious to windstorms. One step in such direction would be achieved through the use of composite poles. Research has indicated that composite poles, even with wind-loading attachments, have better withstood the devastating winds of major hurricanes, when compared to the wooden poles now in use by WAPA. A second step toward building a more resilient system would be the relocation of overhead facilities to underground. The total number of composite poles that would be needed to replace wood poles on the main distribution feeders in the St.

Thomas-St. John district is 4,290, and 5,854 for the St. Croix District. The approximate cost of materials and supplies to complete restoration is \$30,000,000.

In addition to hardening our distribution system, WAPA must also address the electric grid which is also susceptible to damage from windstorms. WAPA's proposed plan is to construct a series of micro grids on each island.

Each microgrid would be a localized grouping of electricity sources that would operate in tandem with WAPA's generating facilities. Each could be disconnected and function autonomously as physical and/or economic conditions dictates. For example, In the event of an electrical service interruption, the microgrid would function as a small facility generating on its own power. Currently, WAPA is planning to develop the first ever micro grid facility in the Virgin Islands, in conjunction with the Virgin Islands Port Authority at the St. Croix Henry R. Rohlsen Airport. This microgrid would be energized with 4 MW of solar power and 2 MW battery storage. As funding permits, additional microgrids will be developed at other locations within and around the Territory. Plans for the Authority's grid, as well as efforts for a more robust T&D system are all contingent on acquiring the necessary funding for these projects. The Authority has already approached the USDA's Rural Utility Service in regards to funding these projects, as well as our future needs. I would like to thank you for the opportunity to appear before the Subcommittee on Energy today. I am available to answer any questions that you may have.



JULIO A. RHYMER, SR.
EXECUTIVE DIRECTOR/CEO
VIRGIN ISLANDS WATER and POWER AUTHORITY

**STATEMENT BEFORE THE
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON ENERGY
UNITED STATES CONGRESS**

HEARING ON

***The 2017 Hurricane Season: A Review of Emergency Response & Energy
Infrastructure Recovery Efforts***

November 2, 2017

SUMMARY:

- On September 6th and 19th, 2017 two back to back category five hurricanes hit the Virgin Islands destroying transmission and distribution facilities on both islands.
- There are five (5) critical areas that must be addressed in order for the electrical system to be restored: equipment, materials and supplies, funding for operations, emergency restoration crews and housing for restoration crews.
- The current major challenges are the funding for day to day operations and hardening of the system for future hurricane events.