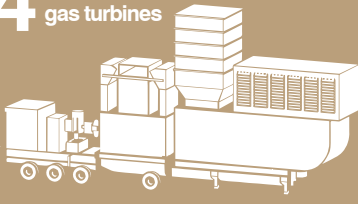


U.S. Virgin Islands



At a glance

4 TM2500+ gas turbines



- 1ST LPG-FIRED MOBILE TURBINE IN COMMERCIAL OPERATION
- MILLIONS OF DOLLARS IN FUEL COST SAVINGS
- REDUCED EMISSIONS VS. DIESEL RECIPROCATING ENGINES

“For years now, WAPA has had a positive relationship with APR Energy, and we are pleased to work with them in becoming the world’s first electric utility to place an LPG-fired TM2500+ into commercial operation.”

Julio Rhymer, Sr.

*Executive Director and CEO
U.S. Virgin Islands Water and Power Authority*

Challenges

- FIELD TESTING AND VALIDATING A PROTOTYPE PLANT
- INTEGRATING NEW PLANT WITH EXISTING INFRASTRUCTURE
- ENSURING PLANT STRUCTURES MET SEISMIC REQUIREMENTS

Background

In 2012, more than 95% of the U.S. Virgin Islands Water and Power Authority’s (WAPA) generating capacity ran on diesel fuel. After experiencing large fluctuations in spot prices during the previous decade, due to swings in crude oil prices, WAPA began to evaluate alternative fuels for power generation. In 2013, WAPA made the decision to shift much of its generating capacity to propane, citing its lower cost relative to other fuels and reduced emissions.

Solution

In late 2016, WAPA awarded APR Energy – which has operated a 25MW diesel-powered turbine on the island of St. Thomas since 2012 – a contract to provide an additional 25MW of generating capacity fueled by propane. The project features a modified GE TM2500+ mobile gas turbine, the first ever to be commercially operated on a liquefied petroleum gas (with the ability to switch to diesel in the event of propane supply disruptions). The project posed several challenges, including the need to squeeze the turbine and exhaust system into existing power plant infrastructure that offered just 4-5 inches of space to maneuver the equipment. The prototype project required field testing and validation of the converted turbine and new operating software prior to commissioning, and APR Energy’s engineers modified the vaporizer system during installation for more efficient conversion of liquid fuel into gas. Finally, since propane is a more volatile fuel than diesel, additional concrete footings were installed to better support the vaporizer and ensure the structure met seismic requirements.

Outcome

In early 2017, APR Energy commissioned the world’s first mobile gas turbine to operate commercially on LPG. Since fuel accounts for approximately 70% of the cost of power generation, WAPA expects to save millions of dollars a year by converting to propane, which should remain relatively stable in price while experts forecast a 15% cost increase for diesel fuel through 2019. WAPA also is benefiting from significantly lower emissions – including a 94% reduction in NOx emissions – which is important to its tourist-based economy. The viability and attractiveness of LPG-fired generation has been affirmed by WAPA, which in early 2017 extended the initial agreement from 12 months to 24 months and contracted APR Energy to install a second LPG turbine at the end of 2017.