

# maximizing performance in electricity load response programs



By Christopher Franklin

Electricity demand  
response programs  
lower energy costs  
by reducing demand  
on the grid

**A**s an industry delivering the planet's most important and recycled natural resource—water—we inherently are environmentally conscious. As such, it is imperative to continuously assess the environmental impact of our operations. Our responsibility to deliver clean, safe drinking water should be matched by our commitment to the sustainability of our planet's environment.

Energy load response programs, and the array of solutions that can be combined with them to offset overall costs, are a great avenue for water utilities to explore energy efficiencies. For companies that are able to limit or reduce energy use in response to various grid conditions, load response programs can deliver revenue and energy offsets while helping to minimize the risk of sudden disruptions on the power grid.

Aqua Pennsylvania recently embarked on a program to reduce energy costs by managing its demand on the grid during key high-demand periods in partnership with PJM Emergency Demand Response (DR) and Constellation Peak Response (PR). This initiative can be replicated across other water utilities where such programs exist.

Further, Aqua's ability to effectively participate in both programs has been enhanced by the use of Constellation's VirtuWatt technology, which provides real-time monitoring of the company's energy usage and performance tracking of facilities participating in the load response programs. Incorporating this technology into Aqua's control center allows its engineering team to establish performance baselines that can be used to set goals for future load response events.

## Response Programs to Consider

Aqua works with retail energy provider Constellation to participate in two load response programs to promote grid stability through incentives to reduce electric demand during limited hours on days when the electric grid is at maximum capacity.

Here is a closer look at how each program works:

**PJM DR program.** On an annual basis, Aqua determines how much electric load it can curtail during PJM grid emergency events, which can last up to six consecutive hours. Aqua restricts electric load from the grid by operating emergency generators. In return, Aqua receives payment for curtailing energy use based on PJM capacity and emergency energy prices.

**Constellation PR program.** On a voluntary

basis, Aqua also participates in Constellation's PR program, which allows energy supply customers to reduce future capacity and transmission costs by lowering energy consumption during the hours of peak demand. Constellation provides Aqua with forecasts of potential peak grid days (typically 10 per summer), and Aqua responds by modifying its pumping protocol for up to three hours during each event.

Through participation in these programs, Aqua expects to receive more than \$500,000 during the 2013/2014 fiscal year in the form of DR payments and PR electricity supply credits. The payments and credits help reduce Aqua's electricity budget, which totals more than \$10 million in annual expenses for its Pennsylvania systems.

To further maximize the benefits of these programs, Aqua has incorporated Constellation's VirtuWatt real-time electric monitoring technology into the administration of its DR and PR programs.

By incorporating the monitoring platform into its water distribution control center, Aqua has expanded visibility to electricity grid demand and real-time usage when participating in load response programs.

With real-time access to data for its 16 participating water treatment plants and pumping stations, Aqua is able to initiate and monitor advanced load reduction strategies at its major facilities. The improved monitoring and recording technology encourages setting goals by providing performance baselines and road maps for future electric load response seasons.

## In Action

As part of the required annual response test, the Aqua control center monitored each facility as it dropped its electric grid demand prior to the start. With each facility identified on a chart, the team tracked individual facilities' performances, as well as the collective drop of approximately 10 MW of all of Aqua's participating facilities off the electric grid.

## Key Takeaways

Water systems located in regions with strong market incentives for electric load management can take a similar approach and get started by investigating the energy load response programs available, select those that make the most sense financially and operationally, and work to maximize performance as part of the company's overall



energy management plan.

While the DR and PR programs can be undertaken without an electric monitoring system measuring real-time demand, the lack of visibility into both grid and facility level energy data can reduce the ability to set goals, monitor performance and make informed operational adjustments as issues arise during program events.

By integrating an electric demand monitoring system into its control center, Aqua is improving its performance in the electricity load response programs and benefiting its

ratepayers by offsetting larger amounts of its electricity expenses.

**Industry Recognition**

Aqua was awarded the National Assn. of Water Companies' 2013 Management Innovation Award for its pursuit of maximizing performance in electricity load response programs, beating out eight other competitive entries.

These same efforts made Aqua a finalist, among other multinational organizations, for the Platts 2013 Global Energy Awards in the

"Energy Efficiency-Commercial End-User" category for its efforts in reducing energy use during periods when the electric grid is at maximum capacity. **WWD**

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