

# Betting on Batteries

AEP SEEKS RELIABILITY

BY SALVATORE SALAMONE

**SEEKING TO BOOST RELIABILITY IN** the short term and integrate wind-generated energy in the long term, American Electric Power is about to deploy several large-scale sodium sulfur batteries on its distribution grid.

The company has ordered three of the batteries, each rated at 2 megawatts, from NGK Insulators of Japan.

Michael G. Morris, AEP's chairman, president and CEO, said, "These new installations will move us a step closer to the full potential of advanced energy storage technologies in areas like reliability improvement, peak-load shaving, and the use of stored energy from renewable sources like wind to supplement available generation resources."

something in the 1 to 10-megawatt range with four to eight hours of energy storage," Nourai said. "That eliminated many other battery types."

An additional condition that had to be met was a need for relocatability. The idea is to use the batteries at specific substations to delay the need for an upgrade. When the upgrade does take place, AEP will be able to move the batteries to another location. "Other batteries are three to five times larger, so they are harder to relocate," Nourai said.

That relocation requirement also eliminated some non-battery technologies that could serve the same purpose. For instance, some companies rely on a hydroelectric or compressed air technology to complement a substation's power. Neither can easily be moved.

## BEYOND THE PILOT STAGE

This new battery deployment is not a technology evaluation project. This is an operational deployment, according to Nourai. The batteries are intended to help AEP support the exponential growth in demand of distributed generated power hooked up to its grid.

Another consideration for using these batteries is to support future wind generation efforts. The idea of using batteries to store energy generated by alternative power generation technologies such as wind and solar is gaining attention these days. For instance, so-called wind-to-wire efforts seek to store wind power generated at night when demands are low. Similar efforts with solar energy projects seek to smooth out day to night variations in solar generated power.

According to Nourai, wind storage was a consideration when selecting the batteries. However, he noted there were higher priorities including improving reliability.

In particular, one of the batteries will be used in West Virginia where storm-related power outages can be quite common. The batteries will provide energy storage in the middle of the line to reduce the total customer outage minutes. For that effort, AEP will add 2 megawatts of sodium sulfur battery capacity near Milton, W.Va., to enhance reliability and allow for continued load growth in that area, according to the company.

AEP will put another 2 megawatts of battery capacity near Findlay, Ohio, to enhance reliability, provide support for weak sub-transmission systems, and avoid equipment overload.

Factors like these are being used to cost-justify using the batteries. For example, it is expected to cost AEP \$27 million for the batteries, the associated work to prepare the three substations, and for control systems. Some of the cost can be offset by a reduction in customer outage minutes and by providing additional capacity to postpone substation upgrades.

The total 6 megawatts capacity of these batteries is just the start. "Our near-term goal is to have at least 25 megawatts of sodium sulfur battery capacity in place by the end of this decade," Morris said. The company hopes to add another 1,000 megawatts of advanced storage technology in the next 10 years.



The sodium sulfur battery installation at AEP's Charleston substation is designed to enhance grid reliability.

PHOTO COURTESY OF AEP

## NewsFlash

### HYBRIDS FUNDED

The federal government will pump \$20 million into research for plug-in hybrid vehicles.

Five projects researching battery technology for the vehicles will be supported by the funds from the U.S. Department of Energy, according to a report by United Press International.

The federal government would like the hybrids to be competitively priced by 2014 and commercially available two years later.

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The use of this type of battery is not that common. However, AEP has been an early adopter of this technology – its first pilot program was in 2002.

Traditionally, utilities have relied on lead acid batteries. And some utilities now use batteries based on other technologies that while promising, are not yet as robust or do not have the storage capacity of the sodium sulfur batteries.

So why the interest in the batteries? According to Ali Nourai, strategic technology consultant and battery guru at AEP, the company selected the batteries for a number of reasons. "We wanted



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