



A Smarter Electric Circuit: Electric Power Board of Chattanooga Makes the Switch

EPB of Chattanooga, Tennessee, is one of the largest publicly owned providers of electric power in the country. Established in 1935, EPB covers about 600 square miles and serves about 170,000 customers in Tennessee and Georgia. Chattanooga is making its distribution system more robust while improving operations with the deployment of smart grid technologies which will allow EPB to provide continued reliable electric service and respond more effectively to severe weather events, which are frequent in the Southeast.

Distribution Automation Investments Make A Difference

Partially funded with \$111.5 million in Recovery Act stimulus funds awarded by the U.S. Department of Energy, EPB is upgrading its distribution system with installation of advanced automated feeder “smart” switches and sensor equipment for 164 distribution circuits. The utility plans to deploy approximately 1500 smart switches system-wide. The smart switches are able to remotely detect customer outages, isolate damaged sections of their power lines and restore power to customers more quickly and for much less cost.

Insert photo: EPB intelliruptor.jpg

Alt text: advanced automated feeder on distribution line

Caption: Smart switches installed in EPB service territory

Smart Switches Effectively Respond to Spring Storm

On April 27, 2011, EPB’s service territory was hit by the most damaging storm in the utility’s history. Nine tornados ripped through neighborhoods and business districts, impacting the entire EPB system. “The whole community was devastated by the damage done in terms of loss of life and property,” says David Wade, EPB Executive Vice President and Chief Operating Officer. “Three quarters of our customers — 129,000 residences and businesses — were out of power.”

Insert photo: EPB aspion_pole.jpg

Alt text: power pole downed by storm

Caption: Downed power line as a result of April 2011 storm

In the wake of the April storm, EPB conducted the largest system restoration it has ever undertaken. When the storm hit, EPB had 123 smart switches in service, and only one of those switches went off line during the storm. Even though company staff spent days manually switching circuits that would have been automatically switched had the smart switches been fully deployed, restoration was improved with the data from the initial switches and other sensing devices. EPB was able to avoid sending repair crews out in the field 250 times since the data provided outage information not previously available. Restoration was formerly done by EPB dispatchers sending repair crews to outage locations only after customers informed the company of such outages, costing time, money and longer outage periods.

During the storms, the smart switches proved to be very valuable as thousands of hours of outage time were avoided due to the devices and automation already installed. Moreover, the experience with the new devices and automation indicates that EPB is on track to realize significant improvement once all of the automation is complete. Information derived from the smart switches will help the company analyze the impact of storms and will be useful for future planning purposes. "We expect the number of customer-minutes lost to power outages to be down by 40 percent or more, and that's something that will benefit customers throughout the whole area," said Jim Glass, Manager of Smart Grid Development at EPB. EPB officials estimate the increased reliability from its project is worth at least \$35 million a year to Chattanooga area businesses and homeowners.

Additional Investments in EPB's Distribution System

The deployment of additional equipment in the field is part of EPB's plan to more fully automate its distribution system. Data from the smart switches will also provide the intelligence needed to calculate real-time loading on each of EPB's transformers so that demand can be better calculated and planned for, thus utilizing existing capital assets more effectively. In addition to its smart switches, EPB will also upgrade its supervisory control and data acquisition system (SCADA), which will improve the system's control room dispatcher's ability to see events happen in real time over the entire EPB service territory. Having this improved operator situational awareness gives EPB the ability to improve system service seamlessly, while the smart switches help to improve reliability and reduce line losses and operations and maintenance costs. Advanced metering infrastructure with improved two-way communications capabilities will also be deployed throughout EPB's service territory.

Learn More

The American Recovery and Reinvestment Act of 2009 provided DOE with \$4.5 billion to fund projects that modernize the Nation's electricity infrastructure. For more information visit www.smartgrid.gov or www.oe.energy.gov. There are five recent reports available for download:

- *Smart Grid Investment Grant Progress Report, July 2012*
- *Demand Reductions from the Application of Advanced Metering Infrastructure, Time-Based Rates, and Customer Systems – Initial Results, December 2012*
- *Operations and Maintenance Savings from the Application of Advanced Metering Infrastructure – Initial Results, December 2012*
- *Reliability Improvements from the Application of Distribution Automation Technologies and Systems – Initial Results, December 2012*
- *Application of Automated Controls for Voltage and Reactive Power Management – Initial Results, December 2012*