



ALABAMA POWER MODERNIZES GRID USING DATA ANALYTICS AND S&C'S ADVANCED LATERAL PROTECTION

S&C FEATURED SOLUTION: TripSaver® II
Cutout-Mounted Recloser

LOCATION: Alabama

“Our strategic deployment of the TripSaver II reclosers has proven to reduce operating costs and improve reliability, bringing benefits both to our customers and our stakeholders. Temporary faults, such as squirrels and small limbs, make up a large portion of our outages. By installing TripSaver II reclosers in targeted locations, the company has been able to reduce these outages, resulting in fewer unnecessary, costly truck rolls and a reduction in customer outages.”

—David Boyd, Principal Engineer,
Alabama Power



Customer Challenge

Alabama Power is a subsidiary of Southern Company and the largest electric utility within Alabama, delivering power through 85,586 miles of lines in the southern two-thirds of the state. It operates in one of the most storm-prone areas of the country, facing tornadoes, thunderstorms, and tropical storms year-round. The continual rush of disruptive weather events is a looming threat and impacts power reliability and resilience for 1.5 million customers.

The utility recognized the importance of minimizing outages on its lateral lines to enhance power delivery to customers. Investigating areas of its system with performance concerns, Alabama Power determined certain fuse-protected laterals, while operating as intended, exhibited a higher degree of unreliability. These conventional lateral fuses would cut off power to customers whenever they detected fault current, even if the cause was temporary in nature.

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FIGURE 1. Alabama Power crews work to restore power in a rural area.

Considering the rural nature of its service territory and more frequent and severe storms, outages were creating reliability issues and affecting customer satisfaction. Because crews must travel to each outage location to replace a blown fuse, these incidents also impacted operations and maintenance (O&M) costs because of frequent truck rolls. To address these issues, Alabama Power felt reevaluating its lateral-protection strategy could be valuable.

S&C Solution

Alabama Power's team exploring an advanced lateral-protection solution was familiar with S&C's TripSaver II Cutout-Mounted Recloser, having deployed it on some laterals to replace aging assets and reduce O&M expenses.

Confident in the TripSaver II recloser's proven effectiveness, the team decided to expand its role to address fuse-protected laterals. By bringing fault-testing to the lateral level, the TripSaver II recloser would prevent temporary faults from becoming sustained outages.

The utility analyzed comprehensive outage reports and reliability indices to identify the best locations for installing the reclosers. The team then deployed the first test case of 20 TripSaver II reclosers in the greater Birmingham area.

After a year in the field, Alabama Power studied the reclosers' performance and measured the results. This evaluation showed outstanding reliability improvements.

The utility saved 106,947 customer minutes of interruption and avoided \$15,570 in truck roll costs. The data demonstrated TripSaver II reclosers could improve its system and remove expenses.

Results of 20 TripSaver II Reclosers in One Year

106,947
CMI SAVED

\$15,570
O&M Savings

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“The success of the pilot gave us confidence in the incredible opportunity to reduce O&M costs and improve customer satisfaction. The team rallied together and developed a very effective game plan and workflow that has allowed us to meet the challenges, track our progress, and achieve our goals.”

—Chris McClain, Grid Transformation Supervisor, Alabama Power



FIGURE 2. A TripSaver II recloser installed on Alabama Power’s lateral line.

The results motivated the team to use TripSaver II reclosers to accelerate Alabama Power’s grid-modernization efforts and improve the customer experience across its service territory.

To make the most efficient upgrades possible, the team developed a suite of tools called Grid Inform, which uses data analytics to help identify and prioritize potential projects.

The Grid Inform tool considers a range of data inputs, such as worst-performing feeder ratings, lost revenue from frequent outages, the impact of truck rolls on O&M costs, and vegetation-management costs.

The tool targeted areas of Alabama Power’s service territory that would benefit the most from a change in lateral-protection strategy and investment in new technology.

The next step was an expanded deployment of approximately 100 TripSaver II reclosers throughout various parts of the state, supported by additional data analytics. Using the Grid Inform tool, the team selected locations that replaced first-line protective fuses on laterals with TripSaver II reclosers.

“We were able to combine multiple data sets to build a robust data-analytics tool to evaluate our system that would help us prioritize the most strategic investments. It gave us the targeted locations to install TripSaver II reclosers. The data have shown how these lateral reclosers have quickly improved our system for our customers while also providing incredible O&M savings. We believe they are now a core part of our grid-modernization plans.”

—Shane Powell, Data Analytics and Innovation Manager, Alabama Power

Results

After analyzing the results in the field for two years, the 100 deployed TripSaver II reclosers registered significant improvements for both the utility and its customers.

As storms and wildlife pressured the system, the data revealed 71% of faults were temporary, and the reclosers prevented these faults from becoming sustained outages. The team also included major event days in its evaluation to better track customer satisfaction and O&M cost savings during both blue-sky days and severe weather.



FIGURE 3. The TripSaver II recloser transformed grid reliability for Alabama Power's customers.

As a result, laterals protected by TripSaver II reclosers went from experiencing an average of 2.1 sustained outages to 0.47 sustained outages per year. The real-world impact for customers meant these **households went from experiencing a sustained outage more than twice a year to once every three years.**

The installation resulted in a 70% improvement in our System Average Interruption Frequency Index (SAIFI) and a 57% improvement in our System Average Interruption Duration Index (SAIDI) where TripSaver II reclosers were deployed.

Results of 100 TripSaver II Reclosers

70% SAIFI Improvement | **57% SAIDI Improvement**

“The TripSaver II recloser has both reduced customer outages and created long-term O&M savings. The Alabama Power data-analytics team used historical information to identify locations with frequent sustained faults, and the TripSaver II recloser was installed in place of existing fused cutouts. The upgraded sectionalizing of the TripSaver II recloser has improved reliability, reduced callouts, and improved our customers' experience.”

– Brian Doyle, Eastern Division Operations Manager, Alabama Power

Because of the results from this targeted program, Alabama Power confidently developed a strategic grid-modernization program throughout the state, which involved **installing 1,500 TripSaver II reclosers per year over 10 years.** The utility expects the number of TripSaver II reclosers to increase annually as it anticipates continued impressive results.

With more than 4,000 TripSaver II reclosers deployed as part of its grid-modernization program, the devices have already positively impacted thousands of customers and **eliminated more than 6,000 interruptions annually.**

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“In addition to increased reliability and lower O&M costs, our use of the TripSaver II recloser has had a positive operational impact. Every saved truck roll equates to one less incident that must be managed by Distribution Control Center personnel. That also means fewer incidents that require switching to be performed by field personnel and system operators. As we seek to reduce the exposure to critical risks, we count that as a win in terms of safety for our employees.”

– Chad Parks, Distribution Control
Center Manager, Alabama Power

With every TripSaver II recloser installed, the Grid Inform tool captures more data. Alabama Power's team analyzes the information to strategically deploy additional TripSaver II reclosers throughout the grid to ensure maximum benefit to customers.

The tool also enables Alabama Power to gain a deeper understanding of its system and find the most efficient path to advance overall system capabilities through broader grid-modernization efforts.

By leveraging the data and capabilities of the TripSaver II reclosers, the widescale deployment is helping Alabama Power improve reliability and prevent unnecessary truck rolls, allowing crews to focus on modernization efforts and prepare the grid for the challenges of tomorrow.

