



UK Emphasis on Performance-Based Regulation Drives Lateral Recloser Adoption

S&C Featured Solution: TripSaver® II Cutout-Mounted Recloser

Location: United Kingdom

Customer Challenge

Western Power Distribution (WPD) is one of the United Kingdom's largest distribution network operators, with a customer base of 8 million people located in Wales, Midlands, and South-West England. Because of the rural nature of its customer base, WPD's electrical grid was experiencing a significant number of temporary faults along its lengthy feeder and spur lines. Outages along those lateral lines were becoming a regular nuisance because the region often experiences faults caused by vegetation, wind, and birds, all leading to power interruptions for the operator's customers.

When temporary faults occurred, they often created permanent outages that forced WPD to dispatch a repair crew. Each site visit cost hundreds of pounds and took the crews multiple hours to make repairs. These outages were leading to increased operation and maintenance (O&M) costs and were negatively impacting reliability metrics. But more importantly, they were affecting customer satisfaction.

To solve future challenges facing British electricity distribution utilities, including addressing reliability issues, British regulator Ofgem created a new, performance-based incentive framework. Called RIIO (Revenue = Innovation + Incentives + Outputs), the programme measures performance in six separate categories, or outputs. However, the outputs are not weighted evenly, with overall grid reliability being given the highest financial weight.

Using the framework in its rate-setting process, Ofgem motivates utilities to create long-term solutions by rewarding them with increased revenue or, inversely, by penalising them if the investment fails to meet performance-based targets.

To maximise the benefits of the incentive framework, one of the key areas WPD chose to concentrate on was improving reliability issues by reducing customer interruptions and customer minutes lost.

After the targets were set, WPD developed a business plan aimed at meeting its performance-based goals, including boosting customer satisfaction and improving overall grid reliability. Accomplishing these critical goals meant the utility needed help to address permanent outages caused by temporary faults along its fuse-protected lateral lines.

"It has been good to work with S&C and create a new application for the TripSaver II recloser on our network. The trial showed benefit to customers and, as a result, we have included the use of this technology within our business plan. This will improve service to our customers and reduce fault impacts."

*—Paul Jewell,
System Development Manager,
Western Power Distribution*

WPD chose the TripSaver II recloser to decrease O&M costs, improve reliability metrics, and boost customer satisfaction

UK Emphasis on Performance-Based Regulation Drives Rural Recloser Adoption

S&C Solution

Through a long-term relationship built over many years, WPD turned to its trusted partner S&C for its innovative solutions. To help solve unnecessary outages, S&C suggested using its lateral protection solution, the TripSaver II Cutout-Mounted Recloser, to meet the utility's ambitious goals.

Because up to 80% of overhead distribution faults are temporary, the single-phase TripSaver II recloser would help prevent such faults from becoming permanent outages. The recloser accomplishes this by testing the line when fault current is detected and closing back in if the source of the problem was temporary. This would drastically reduce customer interruptions and customer minutes lost on the spurs, trim O&M costs by preventing costly site visits, and most importantly, keep customers' power on. For households experiencing multiple outages throughout the year, this would be a transformational outcome.

WPD chose to test the TripSaver II recloser for these reasons and because it could coordinate with other smart devices and possessed a four-shot recloser design. This means the TripSaver II recloser will test the line for fault current four times, allowing more time for temporary causes to be resolved. The utility also favored the S&C solution because of access to real-world data, the ability to configure time-current characteristic curves before delivery, and the ease of installation for line crews.

The utility proceeded with a 12-month pilot of 27 TripSaver II reclosers in 10 separate South-West England locations that provide electricity to 917 customers. WPD chose these locations because they represented a mix of spur lines that historically had experienced a large number of temporary faults in addition to more average-performing spurs.

S&C supported the pilot in a variety of ways, including helping WPD receive buy-in at each utility decision-making level. S&C accomplished this by holding demonstrations on how the TripSaver II recloser works, hosting Q&A sessions and bi-monthly online training, and creating FAQ informational documents and help cards for engineers. For the selected 10 locations, S&C travelled to every trial site to individually train each regional line-crew member.

WPD installed TripSaver II reclosers to improve reliability issues on spur lines.





Results

WPD experienced immediate results, and the TripSaver II recloser pilot verified the device's ability to mitigate the impact of temporary faults at most trial sites. Throughout the 12-month trial period, the TripSaver II reclosers consistently prevented temporary faults from becoming permanent outages, significantly reducing WPD's operating costs and positively impacting customer reliability.

In total, the 27 TripSaver II reclosers used in the pilot cleared 16 temporary faults that previously would have become permanent, reducing the number of customers directly impacted and preventing the utility from having to send crews to the sites for repairs. Avoiding these site visits saved approximately 480 miles of travel and reduced about 149 kilograms (328 pounds) of carbon emissions.

Based on incentive rates set by Ofgem, WPD's cost benefits from substantially reducing customer interruptions and customer minutes lost, as well as avoiding site visits, totalled £259,300 (US\$319,000) for the one-year trial period. The TripSaver II reclosers proved to be effective in the field and provided a rapid return on investment. Based on the trial data, the average payback period for the TripSaver II reclosers installed on WPD's rural spur lines was only 2.1 months. Because of these positive results, WPD plans to install more single-phase reclosers across its system.

The TripSaver II recloser was key to resolving temporary faults along WPD's distribution system.

