



New Generation of SWER-Line Reclosers Reduces Outages for Rural New Zealand Customers

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

Location: South Island, New Zealand

Customer Challenge

PowerNet Limited is the fourth-largest investor-owned utility in New Zealand based on the regulatory value of the network it manages. Serving more than 70,000 customers, the company operates at the southernmost tip of the South Island. Its electrical grid consists of a wide range of medium-voltage distribution equipment, including one of the country's largest single-wire earth return (SWER) networks. These lines were originally designed in New Zealand nearly a century ago as a cost-effective way to bring electricity to rural communities. Because of its simple construction and low cost compared to two- or three-phase systems, the design is still preferred across parts of New Zealand and Australia for rural power distribution.

PowerNet, like many other utilities, had been using hydraulic reclosers for protection and fault testing along its SWER lines. However, because of their age, the vast majority of hydraulic reclosers were disabled to avoid potential catastrophic failures. This led to higher O&M costs for these lines and, critical to the community, more customers experiencing frequent outages.

Because hydraulic reclosers rely on oil and relatively complex mechanical parts to operate, those that were still in use required frequent maintenance and lengthy repairs. When significant repairs were needed, procuring parts became more difficult and expensive, forcing PowerNet to use spare parts from backup inventory and refurbished units. That added to the overall operation costs because backup inventory of reclosers was also needed to cover emergency replacements when units failed in the field. PowerNet decided to reexamine its protection strategy.

PowerNet is expanding the TripSaver II recloser pilot to all SWER lines after positive initial results.



“S&C’s TripSaver II reclosers are projected to save us 10 truck rolls per week, resulting in a significant reduction in O&M costs versus conventional hydraulic reclosers. More importantly, it means improved reliability for our customers located in the most remote areas of our system.”

*– Jacques Vergottini
Project Manager, PowerNet Limited*

PowerNet decided TripSaver II reclosers were a better option than hydraulic reclosers to reduce outages along SWER lines for its New Zealand customers.



S&C Solution

PowerNet explored alternatives similar to hydraulic reclosers that required less maintenance, could reclose up to four times, reduce inventory requirements, and ultimately decrease the number of outages—while also maintaining the same protection operation characteristics found in hydraulic devices.

The utility was first introduced to S&C's TripSaver II Cutout-Mounted Recloser at a conference for electricity engineers in New Zealand. At the event, S&C conducted a live demonstration followed by face-to-face visits highlighting the benefits of a TripSaver II recloser pilot. PowerNet believed the device's biggest selling point was its easy installation, and the recloser has no user-serviceable or replacement parts, unlike hydraulic reclosers.

PowerNet saw how the TripSaver II reclosers' adaptability and configuration options also provided several benefits over other SWER-line protection options. Unlike hydraulic reclosers, which are fixed mechanical devices, TripSaver II reclosers are user-configured and contain a microprocessor-based relay that gives utilities exact TCC curves and improved

coordination capabilities, including fuse-saving features. The reclosers' smart capabilities also log data for PowerNet, allowing the utility to better analyze events and optimize its system. Using the TripSaver II reclosers also meant PowerNet could reduce inventory costs, trim annual maintenance expenses, and allow crews to avoid multi-hour road trips for outages.

Recognizing how the TripSaver II reclosers could improve reliability in its most remote locations, PowerNet moved forward with an initial trial of six reclosers. S&C supported PowerNet with complete training for both the engineering team and operation crews to ensure familiarity and comfort in deploying the devices. Throughout the trial period, S&C provided ongoing support, data collection, and a review during the midpoint of the pilot.

Results

PowerNet was thrilled with the initial success of the project and decided to increase the number of devices deployed on its power grid. The expanded trial, composed of roughly two-dozen units, has already saved the utility a total of 121 truck rolls. By successfully keeping temporary faults from becoming permanent outages, the TripSaver II reclosers saved an average of eight truck rolls per unit per year, providing PowerNet a swift return on investment.

The clear benefits led PowerNet to expand the pilot to a deployment of 65 TripSaver II reclosers across all SWER lines in the next few years. When the devices are fully deployed, PowerNet expects they will save approximately 520 truck rolls annually, or more than 1,000 crew hours per year on avoided fault-management tasks. That translates to roughly 10 avoided truck rolls per week for PowerNet and a significant reduction in the utility's O&M costs versus conventional hydraulic reclosers.

*A TripSaver II recloser protects SWER lines
in New Zealand.*

