CASE STUDY
IMPROVING RELIABILITY

S&C ELECTRIC COMPANY
Excellence Through Innovation

S&C's TripSaver II Reclosers Help Rural Utility Break Its Annual Maintenance Cycle

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

Location: Northeastern Oklahoma

Customer Challenge

Lake Region Electric Cooperative is a 24,000-meter utility located in Hulbert, Oklahoma. Like many rural cooperatives, it has numerous lines that have hydraulic reclosers installed for feeder protection and sectionalizing. Its base of hundreds of installed reclosers required maintenance, typically on a six-year cycle. Once hydraulic reclosers were in the shop, their repair costs varied widely based on the duty and physical requirements of the returned units, but the utility typically paid an average $600 per unit. When the repair requirements were extensive, it opted to buy refurbished units costing up to $3,000. Once units were repaired or replaced, the cooperative returned them to its inventory and the cycle continued. A significant inventory of reclosers had to be maintained to cover the quantities removed each year for maintenance and to cover emergency replacements when units failed while in service.

To facilitate their maintenance process, pole-top construction standards for hydraulic installations changed along the way to add a bypass switch to eliminate an outage when removing a recloser. This meant the removal time for recloser locations generally took a crew an hour to complete once onsite. However, in some places, crews continued to update locations to add fuses, which required additional time.

Further complicating matters, growth in portions of the utility's system required loading capacities exceeding the continuous rating of existing hydraulic reclosers. Hydraulic recloser series coils have trip ratings designed at twice their continuous rating. Therefore, the coil rating limits the continuous current rating, meaning a 25-ampere unit trips at 50 amps, so moving up to the next standard coil size of 35 amps would trip at 70 amps, which no longer coordinates.

Faced with these types of challenges, Lake Region Electric explored alternatives that could better accommodate device coordination, required less maintenance, and reduced inventory requirements. The utility evaluated several alternatives using microprocessor controls or live-tank designs with potentially high voltage. It found that electronic reclosers with controls generally needed monitoring and maintenance. Another option was an energized tank design, but that would require special operating procedures and training.

S&C Solution

After hearing about S&C's TripSaver II Cutout-Mounted Recloser, Lake Region welcomed S&C to conduct a detailed technical review of the device. All aspects were thoroughly discussed regarding coordination, set up, installation, and operation. Because TripSaver II reclosers have a solid dielectric, with a self-powered configurable electronic control, the utility realized it would be an attractive alternative to hydraulic reclosers and their costly required maintenance cycles. The cooperative agreed to do a small TripSaver II recloser pilot to run first hand through the total process: programming, installation, commissioning, and operation. S&C followed up, assisting with on-site training for operations crews and other stakeholders so everyone involved was comfortable and informed.

"I didn't need a lengthy involved cost-benefit analysis. At half the cost of a new hydraulic recloser, and with the elimination of the maintenance hassle, it was an easy decision to make in switching to TripSaver II reclosers."

– Logan Pleasant, Director of Engineering and Operations, Lake Region Electric Cooperative

Lake Region plans to replace all of its hydraulic reclosers with TripSaver II devices.

Lake Region also realized TripSaver II reclosers could help solve its device-coordination problem. The utility could set the device's electronic control at a 50-amp trip without having to worry about continuous load limitations because the TripSaver II recloser can accommodate continuous currents of up to 100 amps.

S&C field engineers helped Lake Region with its device-coordination efforts. Now, with a user-configurable setting of two operations on the same characteristics to hydraulics for fast operations and the same characteristics on the delayed operations, the co-op has a drop-in replacement for its hydraulic reclosers that coordinates completely.

Although the physical size of hydraulic recloser has never been a primary concern, Lake Region also took the opportunity to use the smaller TripSaver II recloser configuration to improve pole appearance by reducing clutter.

With S&C's help, Lake Region Electric Cooperative is finding new ways to protect its vast rural grid.

Lake Region enjoys a cleaner, simplified installation with TripSaver II reclosers for single-phase cluster mounting.

Results

Lake Region Electric Cooperative was so satisfied with the results of its pilot that it has begun to replace and upgrade its installed base of hydraulic reclosers with TripSaver II Cutout-Mounted Reclosers as existing units are retired or removed from service. In addition, it has begun to use the TripSaver II reclosers for all new recloser installations. The co-op's new cross-arm configuration is also simplifying the updates and installations.

The price Lake Region is paying for the TripSaver II reclosers is about half that of new hydraulic units. Moreover, it found the TripSaver II units to be far more flexible to coordinate and operate. The biggest offsets to the investment toward new upgrades is the elimination of excess inventory necessary to perform scheduled annual maintenance to remove, replace, and repair approximately 150 devices per year, as well as the cost to maintain the in-service units. For Lake Region, this will translate to an average annual savings of at least $120,000 just in maintenance costs alone. Moreover, the cooperative gains added flexibility to accommodate current applications and future system changes it previously couldn't address with hydraulic units.