

# The Lines that Bind Us

**SCADA is the eyes and ears – it allows you to see what’s going on in remote locations.**

by Brenda Kleinjan

**F**ROM CELL PHONES TO COMPUTERS TO INTERNET and e-mail, technology changes in the last decade surround us.

The same holds true at your local electric cooperatives where the cooperative and its employees adopt a variety of new technologies to continue improving on the delivery of reliable electric service to the more than 100,000 electric cooperative members in South Dakota and western Minnesota.

And, following the cooperative principle of cooperation among cooperatives, electric cooperatives in South Dakota and western Minnesota have connected their communications

system, creating a network that extends from the Black Hills in western South Dakota to within an hour of Minnesota’s metro hub of Minneapolis.

The communications system is a SCADA – Supervisory Control and Data Acquisition – system. The SCADA connects many remote parts of the electric cooperative system and allows for centralized collection of data about how the system is functioning.

“SCADA is the eyes and ears – it allows you to see what’s going on in remote locations,” said Jim Edwards, assistant general manager of operations at East River Electric Power Cooperative in Madison, S.D. The transmission cooperative



provides electric transmission for 20 member systems in a 36,000-square mile area of eastern South Dakota and western Minnesota.

The system incorporates a variety of telecommunications methods – microwave signals, fiber optic connections and leased communications lines from the South Dakota Network – that all provide the path for information about how the cooperatively owned electric system in the region is working.

“The control side allows us to control equipment in a substation such as circuit breakers and reclosers as well as controlling motorized switches out in the field on the transmission line and switch gear on the distribution side,” said Edwards.

“The data acquisition brings back data so that we know what the voltages are, what the power flow at different points is and the status of equipment at different points,” said Edwards.

For example, information relayed back to Madison could tell the cooperative if there are issues with equipment, such as a transformer that is too hot, and allow the cooperative to make needed repairs.

“It can provide the location of faults within a tenth of a mile,” said Edwards. Considering that the cooperative operates more than 2,600 miles of transmission line – enough to stretch in a line from Los Angeles, Calif., to Washington, D.C. – that level of information can be helpful.

Both East River Electric and its counterpart in western South Dakota, Rushmore Electric Power Cooperative, have operated SCADA systems for years. As the cooperatives looked to update their equipment, it made sense to combine the systems and work together. Rushmore’s members consist of eight cooperatives in western South Dakota. Information for Western Area Power Administration and Basin Electric Power Cooperative’s transmission lines are also incorporated into the system.

“In the old days, the only people that could see the data were the dispatchers,” said Edwards. “Now, with the Web portal, access to this key data is more open to the people who need it such as the line departments and co-op managers.”

Another technology that cooperatives are using to as part of their mission to provide reliable electric service is automated meter reading. While many cooperatives have had

versions of AMR for several years, others are looking to adopt new AMR technologies and expand their capabilities.

“What that technology will do is allow our crews to have a good idea where a problem is before they leave the office,” said Brian Bultje, manager of operations at Central Electric Cooperative in Mitchell, S.D. In addition to its headquarters office in Mitchell, the cooperative has four outposts. The cooperative stretches two counties wide along Interstate 90 from the Missouri River to Miner and Hanson counties east of Mitchell.

“It should also tell us if there are voltage problems or interruptions. If there are interruptions, there is a problem and we can narrow it down to where to start looking for it and hopefully curtail the problem before we get to an outage situation,” said Bultje.

As AMR technologies have evolved, so have the possibilities of how the technology can be incorporated into the daily operations of your local cooperative.

“We’re not ahead of the game, but we’re not behind, either,” said Bultje.

AMR technologies are being incorporated at Huron, S.D.,-based Dakota Energy Cooperative.

“It gives us access to more information, not only on the operation side, but the engineering side as well,” said Lynn Kruse, operations superintendent at Dakota Energy.

“The member services side gets more information, as do operations, engineer and billing – all so that we can better serve the member,” said Kruse.

By using information from the SCADA system, along with AMR information, the cooperative will be able to zero-in on problem areas. Right now, the cooperative has a general area of where trouble is at, but may have to patrol 15 miles of line from a substation to locate where the exact trouble lies.

“Through the SCADA system, we can send crews to a certain point on the line rather than starting at either the tap or the substation and working our way out,” said Kruse.

The cooperative is also in the midst of collecting the location of its poles through global positioning satellite data. As the poles are tested in the co-ops routine pole testing program, a contract logs the pole’s exact location. Kruse estimated that about a third of the system’s poles have been recorded.

Down the road, Central Electric and other cooperatives are looking at possibly incorporating infrared cameras into their tool kit. The cameras would allow the cooperative to see inside equipment for hot spots – indications that a portion of a device is getting ready to fail. This would allow the crews to possibly make repairs or replace devices before they disrupt service.

**Opposite: Electric cooperatives in South Dakota and western Minnesota employ a variety of technologies to assist their employees in providing reliable electric service across thousands of miles of power line. Distribution cooperatives in South Dakota operate more than 64,000 miles of line - enough to circle the earth two and a half times.**