



Dakota Electric Association Designed for Success

“iPower was developed to deliver the best of both worlds. We started with a market-leading, sophisticated control system in iFIX from GE Digital. We added the software services needed to meet the requirements of electric distribution SCADA. The result is a sophisticated Windows-based SCADA system that is affordable and perfect for the needs of rural electric cooperatives.”

Tony Haresnape, President of Catapult Software

Results

- Fast and easy replacement of aging SCADA system
- Increased reliability and access to data
- Reduced implementation time due to real-world graphic elements
- Affordable solution designed specifically for rural electric utilities
- Consistent picture of utility operation at all times
- Ability to integrate business data to make efficiency gains

The power of SCADA: iPower takes a unique approach to the problem faced by rural co-ops of finding good-quality yet affordable SCADA.

Dakota Electric Association (DEA), founded in 1937 by a group of farmers, is a member-owned, non-profit electric utility serving parts of Dakota, Goodhue, Scott, and Rice counties, just south of Minneapolis and St. Paul, Minnesota. Covering 507 miles and serving more than 95,000 members, Dakota Electric is the second-largest electric cooperative in Minnesota and is ranked among the 20 largest electric distribution cooperatives nationally. The company is committed to providing reliable, affordable electric energy, and a high level of personal service to members and the communities in which they live. Because Dakota County cities are growing rapidly, Dakota Electric Association acquires approximately 2,200 new members each year. To serve its ever-growing population, DEA had to upgrade its obsolete SCADA master station, the most critical real-time system in the business, which serves as the central monitoring and control system used by the electric company to operate its electricity network. As SCADA systems age, they can become unreliable and are difficult to interface with the other computer systems in the business, making it hard for the company to integrate business processes and access critical data.

When SCADA replacement became necessary, Dakota Electric chose iPower—the electric utility version of iFIX, GE Digital's award-winning HMI/SCADA software. Developed specifically for T&D SCADA operations, iPower provides all of the safety, performance, reliability, and management tools

needed to efficiently operate an electric network. iPower is modern, sophisticated, and “evergreen” SCADA software for electric utilities.

iPower SCADA is at the center of the safe and reliable delivery of electricity to DEA's customers. Dakota Electric is a distribution cooperative, providing electric service directly to its residential, commercial and industrial members. Each electricity substation has an RTU (Remote Terminal Unit) and IED (Intelligent Electronic Device) I/O devices. The RTUs and IEDs are wired to analog and digital transducers, relaying their current value/state back to the iPower SCADA computers in the power company's control room. The control room is usually in the power company's headquarters, while the substations are spread across the power network. Communication to the RTUs and IEDs from the control room is often accomplished by radio.

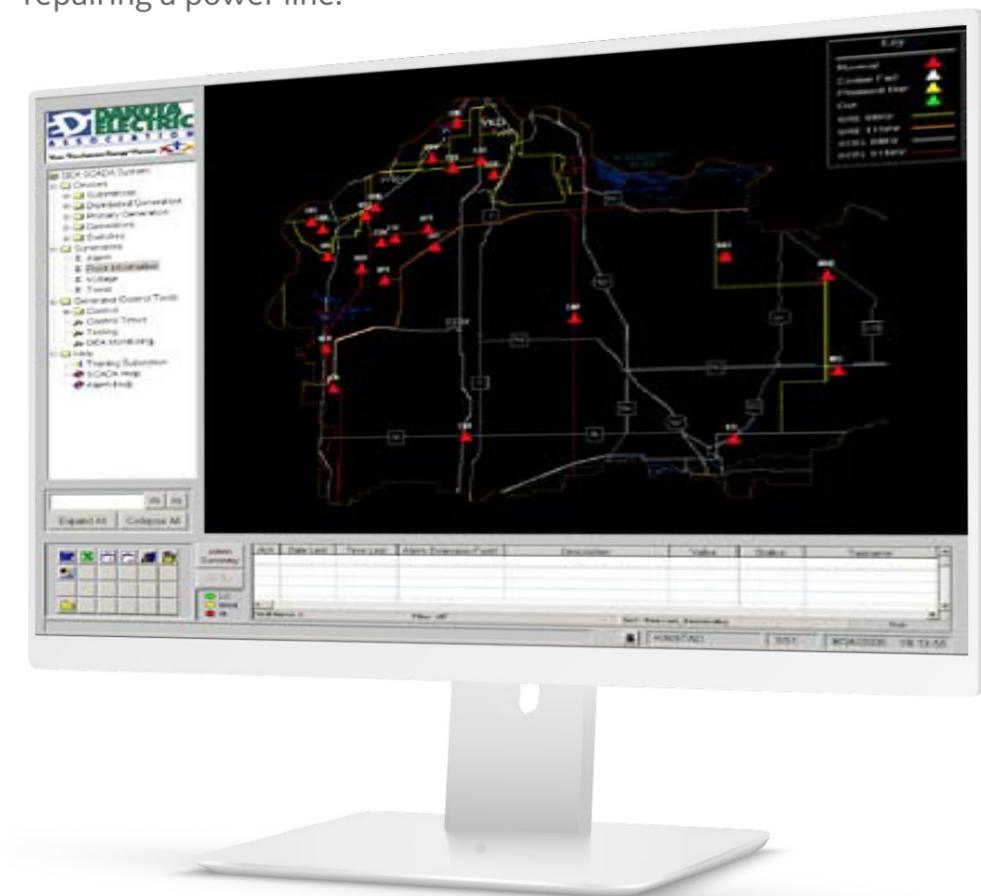
Human operators monitor the state of the electricity network at the iPower workstations by monitoring the system through the information from the RTUs and IEDs. Analog data includes voltages and currents at key locations, and digital data includes the state of the circuit breakers. Alarm and event processing are other important monitoring tools. In addition, operators perform controls such as remote opening and closing of circuit breakers.

“Prior to iPower, the needs of electric distribution cooperatives were not met by SCADA suppliers. iPower offered full-featured, safe, reliable, and affordable SCADA suitable for distribution cooperatives of any size.”

Randy Poulson,
VP Engineering Services for Dakota Electric

The system assists with a clear, concise display of information, starting with a single picture that overviews the whole power network. The operators use this picture to drill down to individual substation pictures to see detail supported by alarms and events lists. This system has approximately 20,000 individual I/O tags and is designed to present critical information in a clear and intuitive way, so that, for example, operators are not swamped with information and alarms during a severe storm that causes many outages.

It is important to DEA that they reduce outage time. Critical measures for the success of the utility are the average time to restore power after an outage, and the number of outages they incur in a year. The SCADA system is a critical tool to help them quickly understand the state of the network and affect repairs. The system also assists in safe operation. Imagine if a circuit breaker is accidentally operated while linesmen were repairing a power line.



Getting graphic

Ready-to-use graphic objects for common elements like circuit breakers and transformers make one-line production fast, simple, and consistent. For example, adding a transformer, including all of its 20-30 analog and digital indications, is a single drag and drop operation.

From a reporting perspective, the company needed two different aspects addressed by iPower. First, after a major event, like a storm that caused an outage, they wanted to review the sequence of events to learn the root cause of the outage and also to understand how the network behaved. iPower provides detailed event records to make this possible. The information is time stamped to 1 ms by the RTU. It also gives the company a long term, easily reviewed record of everything that happens in the system.

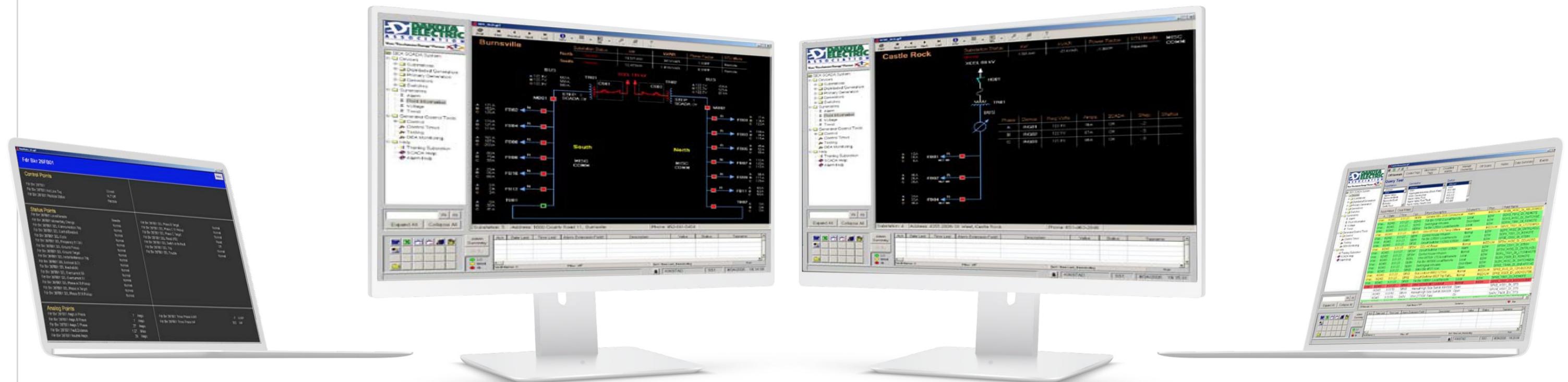
In addition, Dakota Electric needed historical information about how the demand for electricity has varied over the past day, week, and month. The Historian provides this in a tool that makes SCADA data readily available throughout the utility. This information is critical to DEA to understand how to reliably and cost-effectively deliver power to meet the needs of their customers.

“The software is so easy to install and configure, it is possible for cooperative staff to do much of that work with very minimal training,” said Len Jewell, Technical Systems Manager for Dakota Electric. “With iPower, the days of having someone else build your new SCADA system at the factory and you attending never-ending factory testing and training sessions are over.”

The iPower SCADA system is now installed and proven by Dakota Electric. They chose the system after reviewing the existing options on the market, and after extensive bench-testing by DEA engineers.

“SCADA systems don’t need to be complicated and difficult. It doesn’t have to be hard to share information between SCADA and office systems,” said Brian Kinstad, SCADA Engineer for Dakota Electric.

“Upgrading the software can be as easy as upgrading Microsoft Office. You can find a lot of good features in an affordable SCADA system, and the people putting it together can have fun doing it.”



Achieving goals

The results for DEA are clear. From a customer perspective, implementation of iPower delivered more reliable service and therefore fewer outages; and when there is an outage, it is shorter in duration. From an internal business perspective, Dakota Electric has more ability to integrate SCADA data with other business data, so that they are able to find and make efficiency gains and accurately tune their business. With good history and reports that detail the behavior of their network, they are able to improve the efficiency of the network and ultimately lower the cost of electricity for its members.





About GE

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Contact Information

Americas: 1-800-322-3616 or 1-434-978-5100

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