

Case study

Connexus Energy

In Its Element



At a glance

Industry: Field Service

Application: Inspection and Survey

Connexus Energy has cost savings down cold with Intermec mobile computing

Within four minutes of exposure to an ambient temperature of 48 degrees Fahrenheit, the average human hand begins showing signs that all is not well. Blood vessels constrict. As the temperature falls, fingers go numb. Dexterity suffers.

For three Connexus Energy inspectors, dealing with extremities in the extremes is a daily occurrence some four months of every year. Winter wind chill temperatures for these Minnesota workers often drop to well below zero. The company won't send them out in temperatures below minus 10, but anything above that is a normal workday. Historically, this has meant braving severe cold to take 3,000 substation measurements, using a pen and clipboard.

Not anymore. Oh, the Connexus inspectors still brave the cold – can't do much about that – but they've traded the pens and clipboards for Intermec 740 Color mobile computers and mobile CMMS software from DataSplice. The change has sped inspector task time by 43 percent. It has reduced Connexus substation maintenance management costs by the same percentage and, most importantly for customers, has made inspection data available for analysis the day it is gathered.

Connexus Energy is Minnesota's largest electric cooperative. Based in Ramsey, the cooperative serves more than 110,000 customers in a seven-county corridor that runs from Stillwater to St. Cloud. A few years ago, Connexus management began looking for ways to improve efficiency. Once the company had implemented a computerized maintenance management system, mobile computing was the logical next step.

"Mobile computing seemed like one of the simpler projects where the return on investment was really big," said Craig Johnson, IS business systems analyst at Connexus. With it, substation inspectors could enter the 3,000 measurement points into portable computers instead of writing everything down and having to key it into a computer back at the office.

Johnson and his colleagues were thorough in their selection process for a mobile computing system. "We find if you set an objective and stick to it, do your evaluation and pick the right product, you save a lot of money. You don't have to redo it," he said. Evaluation meant giving Connexus substation inspectors products from five vendors – including personal digital assistants, tablet-



type computers and Intermec's 740 mobile computers – and letting them simulate their work in the elements.

"It's one thing to evaluate a device in a building, but if you're going to use it outdoors, that's where you need to test it. You have to see how the screen looks in the sun, and how the device handles," said Brian Sullivan, Connexus systems analyst.

The results: "Our inspectors liked the Intermec handheld computer best because of the durability and the screen, among other things. We had a number of selection criteria," Sullivan said. "One of the inspectors is a bigger guy with big fingers. He wanted to see how his fingers hit the buttons. The Intermec unit came with a numeric keypad instead of an alphanumeric one, which has more and smaller buttons. Bigger buttons – that was a key selling point."

Thirty-nine distribution substations are scattered across the Connexus Energy service area.

Once a month, two of the three Connexus inspectors divide the territory and cover their routes over several days, visiting each substation for a detailed check. They measure such things as oil temperature, silicone condition, circuits, voltage surges and tolerances. The number of inspection points will vary by location, with some substations requiring more than 100 different data entries.

"With the old method, by the time the readings were typed into the office computer and analyzed, it might be a week or more after the measurements were taken," Sullivan said. Equipment operating out of tolerance range would

be flagged for repair. "But by then, that piece of equipment could have failed. You might have customers without power, and obviously that's not good."

Now, when an inspector arrives at a substation, he enters the location into the Intermec mobile computer. The unit runs Microsoft® Windows CE® software for Pocket PC configured by Intermec partner DataSplice and Connexus developers.

"We have standard bolt-on solutions for computerized maintenance management systems, but what Connexus wanted to do was really outside of that," said Jeff Gibson, senior solution specialist at DataSplice. "They decided to have one of our consultants go up to Ramsey and work on development and train their developers at the same time. They built the solution together during a training session."

That training session, with DataSplice consultant Mike Johnson, lasted about eight hours. By session's end, Connexus had implemented the DataSplice product with full connectivity to the production database. Within the first two hours, Connexus designers built a complex Oracle database view that can be easily accessed on the mobile computer's screen. It shows every inspection point in the physical order it appears during the inspector's substation tour.

"If we didn't have that, the inspection points would just be random. The view not only pulls in the inspection points by substation, but also shows the piece of equipment they're looking at, including the equipment number. That helps when creating a work order," Sullivan said.

Guided by an efficient roadmap through each substation, the inspector simply walks from point to point, making equipment assessments or taking measurements.

Wherever possible, Connexus wanted to use pull-down menus to eliminate cumbersome text typing. For an assessment, the inspector chooses from a pull-down value list on the computer screen. Measurements are entered using the mobile computer's numeric keypad and a stylus.

Once the inspection is complete, the inspector locks up and moves on to the next substation. At the end of his shift, he heads back to the office. The Intermec mobile computer uploads its day's cached data to the Connexus database via an Intermec Ethernet docking station.

The company's computerized maintenance management system now has same-day inspection data to analyze. It can compile a report on only those measurements outside the normal range. A maintenance manager can dispatch repair crews within hours instead of days or weeks. The chance for analysis oversights is greatly reduced.

Connexus plans to expand the system for other uses, including inventory control and managing outage crews. "We can see major benefits in so many areas," Johnson said.

In the end, Connexus management wanted a system that would rival many of the qualities of its own inspectors. Rugged. Resilient. Versatile. These are people who endure harsh conditions to ensure that customers get the power they need. Why ask any less of the equipment they use?

"Other equipment we tried didn't stand up to the temperatures. It wasn't waterproof. If you dropped it, it would break," Sullivan said. "We wanted something our guys liked, something durable that we weren't going to have to replace every time one of them dropped it. Intermec gave us all that."

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