Alpena Power Reduces Costs and Increases Reliability

Case Study

Application	Utility
System	7330 ION meters 7700 ION meters 8500 ION meters PEGASYS® software
Benefits	Reduced costs Improved reliability Fast problem response Simple integration Expandability

In the electric utility industry, the last 30 years have been marked by increasing competition. Many companies have strengthened their market positions by investing in technologies that monitor and control their operations with greater precision, speed, and economy.

Edmund Ludwiczak, line department administrator at Alpena Power Company, explains, "Real-time access to accurate data allows us to use our resources more efficiently and eliminate waste that could be costly or debilitating."

Alpena Power, an investor-owned utility in Alpena, Michigan, has established a stellar reputation as one of the state's most reliable service providers. It focuses on power transmission and distribution rather than generation.

Planning for an Upgrade

Ludwiczak plans upgrades and new installations. He also operates the power monitoring system, which checks Alpena's power grid and focuses on power flow and system protection, including energy bought and sold.

"Our old process gave us no real-time data," comments Ludwiczak, and was time-intensive, laborious, and costly. All monitoring was done manually. "We had to physically go out to our 22 substations and record meter readings in hard copy." Then someone consolidated the numbers to get a rough idea of when power was being bought and sold, as well as what condition the power was in.

"We couldn't measure power quality or loading. Thermal demand measures were especially rough. We knew we had a demand of X, but we didn't know when it had been generated. And if there were three or four circuits in a substation, we didn't know whether the demand was coincidental or occurred at different times. Without a good way to measure it, we were replacing equipment before it was necessary."

Alpena decided to apply new metering technology that would allow for remote, real-time access to power data.

"Being relatively small, we decided to take a cautious approach and 'dipped our toe in the pool' with Power Measurement," says Ludwiczak.

"We had been considering remote monitoring for a long time, but the barrier to entry was cost," he says. "What influenced our decision was the fact that this particular system was affordable for a small utility like us. With older systems, you could literally spend millions, and some utilities have.

Ed Ludwiczak (left), Line Department Administrator, and **Beth McDonald**, Metering Supervisor, evaluate power quality reports.

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POWER MEASUREMENT

We found the technological approach we wanted at a fraction of the cost."

They began by testing the system on their interconnect substation and monitoring five major circuits. The results have been so positive that Alpena has now begun a five-year initiative whereby power metering will be installed in all of its 22 substations. The system will incorporate PEGASYS software with 7330 ION, 7700 ION, and 8500 ION meters. "Our short-term communications solution has been to use phone dial-up, but long-term plans are for fiber links so that we can be in live contact with all of our systems simultaneously," he says.

Improving Power Flow Control & System Protection

The power monitoring system has proved valuable in managing demand. During peak times, such as the summer, Alpena must hold to the demand level specified in its energy supply contracts.

Before Alpena installed the meters, it had to keep a person at the substation throughout these periods. "Now if we get into a tough situation," Ludwiczak remarks, "the digital power meters give us a constant read, so we can monitor our purchased power and make sure we stay below our allotted amount."

Another benefit of the system is better power outage management.

"We use the meters, which are backed up by uninterruptable power systems, to monitor power quality and breaker status so we can determine what circuits are in trouble. This allows us to get at the problems faster, resolve them more quickly, and keep our customers better satisfied."

The Core Concept

As Ludwiczak sees it, reduced costs and downtime through better design are the core benefits of power monitoring.

"We've already been able to flag problems we didn't even know existed before," he says, citing harmonics and voltage fluctuation problems as examples. "We might have had a feeling that there were difficulties here and there, but without the proper equipment, we couldn't identify them with any precision.

"The system we chose gave us the metering we wanted, the trending and harmonics we were looking for, plus the ability to monitor digital and analog inputs. The software package was very integrated and reasonably priced. The one we had before wasn't very integrated; you had to access one section to read the meter, another section to monitor inputs and outputs."

Another advantage was flexibility. "We set up our system in pieces," says Ludwiczak. "We drew the schematics as we built it, treating each substation as an individual install in this dial-up phase."

Alpena's facilities are split into a business office and an operations center. The PEGASYS server sits in the business office, and Ludwiczak has access to PEGASYS software from his desktop workstation.

Eight ION® meters operate at the main interconnect substation, a dual voltage station with incoming voltage at 138 kW. The meters monitor the circuit breakers between Alpena and its power supplier, Consumers Energy. An RS-485 bus links the meters to a telephone dial-up modem that, in turn, communicates with PEGASYS.

The meters monitor voltage, current, power, energy, power factor, and the condition of the breakers via digital inputs. They also monitor some critical heaters, AC power to those heaters, and the substation building itself. Although they don't use the system to monitor security now, Ludwiczak anticipates that this function will be added in the near future.

Satisified Customers

"We started preparing for deregulation before it became a buzzword," says Ludwiczak.

"We have five major industrial customers, and the implementation of ION meters and software is part of our ongoing effort to keep those accounts satisfied. We've been very happy with what we've accomplished."

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