CASE STUDY
NORTHEAST U.S. ELECTRIC UTILITY

SMART GRID DISTRIBUTION AUTOMATION KEEPS THE LIGHTS ON IN THE N.E. UNITED STATES

INCREASING SERVICE AND DECREASING OUTAGES WITH SCADA

After its evolution from a vertical to a horizontal utility, this major enterprise began preparing for the technology revolution and the advent of the intelligent grid. Since the early 1980's, the utility has been experimenting with wireless technology to provide communications with field devices.

In the early 2000's, the company had run a proof-of-concept pilot network test, and had deployed a network of 400 sites connected by a 900 MHz and VHF wireless network performing traditional Supervisory Control and Data Acquisition (SCADA) functions. By 2005, the company made the decision to automate its entire distribution system, which involved the addition of hundreds of breaker reclosers and other devices and integrating all that equipment into their existing system.

The utility worked with a team that included Motorola and DigitaLogic to plan and deploy its a distribution automation system. The utility added hundreds of breaker reclosers, remote terminal units (RTUs) and other Intelligent Electronic Devices (IEDs) that were distributed throughout the network. The system now provides real-time connectivity with the more than 2,000 fixed and a number of portable IEDs populating its network of substations, helping to improve service delivery, power availability, outage management and overall productivity.

CUSTOMER PROFILE:

Company:
Northeast United States Electric Utility

Industry:
Utilities

Solution Partner:
DigitaLogic

Key Benefits:
- Quicker fault detection and isolation
- Automated restoration of service
- Better SAIDI performance
- More efficient personnel
- Increased customer satisfaction

Products:
- MOSCAD-L Remote Terminal Units
- ACE3600 Remote Terminal Units

"Because a fully automated distribution system can take five to seven years to implement for a large utility, it's important to have an extremely flexible network with the ability to adapt to advancements in protocols and technology as well as additional system requirements over the years."

Ali Khorramshahi, President, DigitaLogic

THE CHALLENGE

For utilities, making the best use of the smart grid involves significant preparation. They must be prepared to leverage the enabling technologies, standards-based interoperability and low-cost communication technologies and electronics of the Industrial Internet of Things revolution to deliver increased reliability through increased automation and monitoring.

As the organization moved forward with implementing distribution automation, one issue it faced was if and how its legacy 900 MHz and VHF wireless systems could be leveraged in the new system. A solution that could communicate across both medias would make for the most efficient use of resources as well as add redundancy to the system.

The utility also had to account for expansion and integration with their current deployment. This meant the solution had to seamlessly accommodate communication with IEDs from a variety of manufacturers using numerous data protocols.

THE SOLUTION

The utility deployed an approximately 2,000-site network equipped with Motorola MOSCAD-L RTUs to enable a secure and reliable wireless communication network. Motorola's newer ACE3600 RTUs were then integrated into the network as more sites were added. The RTUs support communications with a greater amount of IEDs by accommodating more electronic devices per frequency than any other solution.

The automated distribution system reaches a quarter million analog and digital points through a combination of 900 MHz links (using approximately 20 radio master sites) and VHF frequencies, made possible by the wide array of communication media the RTUs support.

DigitaLogic implemented a sophisticated Distribution Data Management System (DDMS) using their patented IGIN (Intelligent Grid Interface Node) suite of software solutions for automation and management of the real-time data systems.

THE BENEFITS

The system has significantly improved System Average Interruption Duration Index (SAIDI) performance. It is also increasing power availability and levels of customer service for over a million residential and business customers over a service area of about 2,500 square miles.

Automation enables the utility to remotely monitor and control the system, automatically identifying and isolating faults and quickly restoring service. This enables more efficient deployment of the utility's field technicians for repair and restoration. The system is highly cost-effective, eliminating the need for new broadband communication capabilities through its ability to provide real-time data collection and transmission using the utility's existing narrowband licensed 900 MHz and VHF frequencies.

MOTOROLA