Duquesne Light Company

Large US Utility Uses AirLink® Gateways for 24/7 Monitoring and Control of its Distribution Operations Center (DOC)



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For more than 125 years, Duquesne Light has been in the forefront of the electricenergy market, with a history rooted in superior customer service. Today, thecompany continues in its role as a leader in the transmission and distribution ofelectric energy, providing a secure supply of reliable power to more than 585,000customers in southwestern Pennsylvania. Duquesne Light uses more than 45,000miles of overhead lines, 250,000 utility poles and 103,000 transformers to bring power to homes and businesses throughout the region.

BUSINESS CHALLENGE

Previously, Duquesne Light had relied on its own communications infrastructure forall its critical applications. The company’s distribution system was centrally operatedfrom the Distribution Operations Center (DOC), which needed to be manned 24hours a day, 7 days a week. The DOC supervisors were responsible for monitoringand managing the 700 sectionalizers and reclosers within the company’s distribution system.

The company’s main protection scheme uses pole-mounted sectionalizers andreclosers on feeders to divide circuits into distinct load blocks of about 1,000customers. Varying load growth constantly affects the distribution system, forcingDOC supervisors to add or relocate the devices. These devices, however, cannot befully utilized until they are remotely controllable from the DOC, a process that wouldtake three to 12 months to install using a conventional wired backhaul

solution.

Because protection devices were not being fully utilized, Duquesne Light foundthat when a problem occurred, such as a vehicle hitting a pole and downing wires,the protection devices locked up near the problem and shutdown the electricitydistribution to all customers in the surrounding load block areas. This createda disruption that was more far-reaching than those customers in the immediatesurrounding area. Although its existing fi eld equipment was performing withindesign standards and met all government regulations, Duquesne Light also foundan increase in failure rates as its core infrastructure aged, impacting distributionreliability and overall customer satisfaction. Duquesne needed a solution thatwould immediately improve its ability to monitor and control its vast network andinfrastructure equipment.

SIERRA WIRELESS AIRLINK® SOLUTION

Duquesne Light started researching a wireless communications solutions thatwould be cost-effective while improving their distribution system reliability.It believed that distribution automation would benefi t greatly if a wirelesstechnology was available to supplement or replace existing hardwiredcommunications. Also, a wireless solution would enable additional devices andsubstations to be remotely automated at locations where it was previously costprohibitive.

A wireless solution powered by Sierra Wireless’ AirLink® gateway was the mosteffi cient, capable and cost-effective answer.

The Sierra Wireless AirLink gateways were installed into pole-mountedsectionalizer control cabinets. The gateway contains its own built-in TCP-IPstack and supports UDP/TCP PAD functionality. Therefore, there was no needfor special provisions or to add anything to the control cabinets. In addition, thegateway self-regulates its own transmit power level based on received signalconditions and has built in diagnostics and comprehensive tools and utilities toeasily monitor and control the remote devices.

Once the Sierra Wireless solution was deployed, DOC supervisors foundthat they were able to address problems in near real-time and better containthe outage. For example, they were able to remotely control the sectionalizerjust beyond the problem area, thus isolating the actual problem within oneload block, which enabled quick resolution while minimizing the number ofcustomers actually affected. The ruggedness and quality of the gateway madeit intrinsically safe and suitable for the harsh weather and varying temperaturesof southwestern Pennsylvania.

RESULTS

The initial cost to install and automate the Sierra Wireless AirLink gateway wasapproximately $640 per location. This is signifi cantly less than Duquesne Light’sexisting wireline communications installation costs, which are typically $10,000per location. The company has initiated progressive installation of 50 AirLinkgateways per year to extend direct communication to all fi eld automationequipment. Duquesne Light estimates the need for 1000 modems over a 20-year period and, during this rollout period, can anticipate an estimated annualsavings of $468,000 per year.

The solution deployment using Sierra Wireless’ AirLink gateway resulted in:

- Immediate functionality – gateways integrated with existing hardware
- Real-time solutions – enabled DOC supervisors to instantly review data and decide how best to correct the situation
- Better performance – enhanced network management allowed containment of network outages
- Cost-effective deployment solution – wireless saved Duquesne Light $9,360 per location
- Reduced infrastructure expenses – a progressive annual saving of $468,000 per year
- Sustained competitive lead – a concrete long-term program to ensure that Duquesne Light continues to lead the industry in the distribution automation fi eld, expand its service area and maintain unparalleled customer service

APPLICATION:REMOTE ENERGY MANAGEMENT

CUSTOMER CRITICAL CHALLENGE:

- Monitoring and control of remote infrastructure

SOLUTION:

- AirLink® gateways integrated with existing hardware and installed into pole-mounted secrtionalizer control cabinets

BENEFITS:

- Duquesne supervisors able to address problems in near realtime to better contain outages
- Huge savings in depolying wireless versus wired