

Lafayette Consolidated Government

Lafayette Utilities System Smart Grid Project

Scope of Work

Lafayette Utilities System (LUS) is part of the Lafayette Consolidated Government. This municipally-owned electric utility serves the City of Lafayette and surrounding areas – comprising a population of more than 120,000 people over 47.7 square miles in southwestern Louisiana. The LUS Smart Grid project deployed advanced metering infrastructure (AMI), distribution automation equipment, and advanced monitoring equipment including Phasor Measurement Units (PMU) for the transmission system. The network of new transmission and distribution assets provides improved reliability and reduced outage duration, as well as reduced peak loads and overall energy usage across LUS’s service territory. LUS also provided customer access to an enhanced web portal.

Objectives

The LUS project helped to modernize the electric system, providing a number of customer and utility benefits. The overall objective of the project was to improve electric reliability, facilitate customer management of the energy usage and costs, as well as assist LUS in asset optimization and help in reducing its environmental impact. The smart meters reduced meter reading costs, lowered vehicle emissions by reducing truck rolls, and enabled advanced electric services that facilitate customer management of energy usage and costs. Smart grid technologies were deployed to various portions of the electric system to improve electric reliability.

Deployed Smart Grid Technologies

- **Communications infrastructure:** The project deployed meter communications using a radio frequency (RF) mesh network with a ZigBee-based customer interface and backhaul communications based on fiber optics provided by LUS Fiber, LUS’s own municipal broadband company. In addition, new RF-based and fiber optics-based communications assets were deployed on LUS’s transmission and distribution networks to complement LUS’s system monitoring capability through its existing supervisory control and data acquisition (SCADA) system.
- **Advanced metering infrastructure:** The project included system-wide deployment of 65,375 smart meters and the supporting meter data management system (MDMS) over the course of four years. The project also implemented an outage management system (OMS) and fully integrated LUS’s existing customer information system and billing system with the AMI system. AMI, combined with the new communications infrastructure, enables LUS to reduce operating costs and provide new advanced services for its customers.

At-A-Glance

Recipient: Lafayette Consolidated Government

State: Louisiana

NERC Region: Southwest Power Pool

Total Project Cost: \$22,197,604

Total Federal Share: \$11,098,802

Project Type: Advanced Metering Infrastructure
Customer Systems
Electric Distribution Systems

Equipment

- 65,375 Smart Meters
- AMI Communications Systems
 - RF Mesh Meter Communications Network
 - Fiber Optic Backhaul Communications
- Meter Data Management System
- Outage Management System
- Customer Web Portal Access for all LUS customers
- 3,000 Learning Thermostats
- Distribution Automation Equipment for 77 out of 80 Distribution Circuits
 - 136 Automated Capacitors
- SCADA Transmission Line Monitoring Equipment
- 31 Phasor Measurement Units
- 4 Phasor Data Concentrators

Key Benefits

- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Improved Power Quality
- Reduced Costs from Theft
- Reduced Truck Fleet Fuel Usage

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- **Learning thermostats:** As part of the customer information enhancements, the project featured 3,000 learning thermostats that provide customers with information about their energy usage and allow for remote energy management.
- **Advanced electricity service options:** Customers have access to a web portal which enables them to better manage their energy use and make more informed usage decisions based on the near-real-time information.
- **Distribution automation systems:** The project deployed automated capacitor banks with remote SCADA control and monitoring to improve reliability and reduce line losses and operations and maintenance costs.
- **Distribution system energy efficiency improvements:** The project integrated automated capacitors with power quality monitoring systems. The capacitors improve voltage and volt-ampere reactive (VAR) control, power quality, and distribution capacity by reducing energy losses on the distribution system.
- **Transmission system automation and upgrades:** The project deployed or upgraded transmission protection devices at three sites and upgraded SCADA remote terminal units at these transmission stations. In addition 31 PMUs were installed for increased monitoring of the system.

Benefits Realized

- **Reduced operating and maintenance costs:** Meter reading costs have been reduced by approximately \$725,000 per year as a result of automated reading through the AMI system
- **Improved power quality:** Single-phase sensing and switching allows capacitor banks to improve the voltage and VAR flow on each phase independent of the other two phases.
- **Reduced costs from theft:** Alarms from the AMI system greatly assist with detection of theft and unauthorized power usage.
- **Reduced truck fleet fuel usage and greenhouse gas emissions:** Remote reading functionality has allowed LUS to avoid truck rolls, thus reducing fuel usage and greenhouse gas emissions. LUS has also reduced the truck fleet by 11 vehicles with an average savings of \$15,000 per vehicle.
- **Increased visibility on the transmission system:** The PMU data system enhanced the capability of LUS engineers to perform post-event analyses of system disturbances

Lessons Learned

- Simultaneous implementation of several new software systems stretched LUS resources more than anticipated, causing delayed software system launches.
- Public opinion can have an impact on any project. Approximately 400 LUS customers opted out of the smart meter program.
- LUS encountered issues with technology obsolescence and made slight adaptations to the project. In-home displays were the latest technology when the project was conceived; however, LUS found that interactive learning thermostats had more up-to-date technology and functionality to meet the utility management needs of customers.

Future Plans

LUS plans to continue capitalizing on its system improvements to increase operational efficiency and enrich the customer experience by promoting energy efficiency management tools.

Contact Information

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