El Paso Electric
Distribution Automation Project

Scope of Work

El Paso Electric's Distribution Automation (DA) Project involved installation of new switches, relays, fault locators, and sensors on eight distribution circuits. The equipment enables automated response to grid disturbances and helps operators more quickly diagnose outages to reduce restoration times for customers on those circuits. A new supervisory control and data acquisition (SCADA) communications network allows for integration of real-time data from the sensor equipment with the distribution management system (DMS) to provide grid operators with significantly enhanced visibility into the state of the system. The project addressed specific reliability needs in two separate service areas: one in Van Horn, Texas, and one in Santa Teresa, New Mexico.

Objectives

El Paso Electric aimed to improve reliability and power quality as well as reduce maintenance truck rolls, operating costs, and pollutant emissions. The primary objective of the Van Horn phase of the project was to achieve faster service restoration for customers served by a radial transmission line that is subject to outages during bad weather. The Santa Teresa phase involved improving distribution service to a relatively isolated group of industrial and residential customers.

Deployed Smart Grid Technologies

- **Communications infrastructure:** Eight distribution circuits received dedicated phone lines, radio devices, remote terminal units, and a SCADA system to enable remote control of distribution feeder switches. The radio equipment installed relays data from new automated feeder switches to grid operators.

- **Distribution automation systems:** Targeted sections of El Paso Electric's distribution grid have new automated switches and reclosers. The Van Horn phase involved upgrades to remote-controlled switches to safely reduce service restoration times from hours to minutes. The project retrofitted several existing reclosers with radios and installed three-phase electronic reclosers at normally open points. In the Santa Teresa phase, the project deployed intelligent feeder switching capabilities, enabling automatic restoration of service to customers. A central processing unit detects and isolates faults and restores power to the non-faulted portions of the three feeders that were upgraded as part of this project. A total of four distribution switches were automated, providing El Paso Electric's operations center with remote monitoring and control capabilities.

At-A-Glance

Recipient: El Paso Electric

States: Texas, New Mexico

NERC Region: Western Electricity Coordinating Council

Total Project Cost: $2,074,787

Total Federal Share: $958,339

Project Type: Electric Distribution Systems

Equipment
- **Distribution Automation Equipment for 8 out of approximately 300 Feeders**
  - **Distribution Management System**
  - **Distribution Automation Communications Network (Radio Technology)**
  - **SCADA Communications Network**
  - **13 Automated Feeder Switches**
  - **8 Smart Relays**
  - **6 Feeder Monitors**
  - **8 Remote Fault Locators**
  - **6 Voltage Regulators**

Key Benefits
- **Improved Electric Service Reliability and Power Quality**
- **Reduced Costs from Equipment Failures**
- **Reduced Truck Fleet Fuel Usage**

Benefits Realized

- **Improved electric service reliability and power quality:** Thanks to the DA upgrades, during outage events El Paso Electric can identify and isolate the fault through the DMS, which greatly improves system resiliency. Customers affected by the outage can be brought back into service much faster than before the system was implemented.
- **Reduced costs from equipment failures:** Improving system reliability helps preserve equipment and increases the longevity of cables. Limiting exposure to overloads, faults, and other disturbances greatly extends the useful life of the equipment, thus lowering replacement and maintenance costs.
- **Reduced truck fleet fuel usage:** While the majority of El Paso Electric's distribution system requires physical truck visits to operate and monitor grid assets, the new technologies—which were deployed on 8 feeders—provide remote fault monitoring and automated response capabilities, reducing the frequency of crew dispatches. Fewer truck rolls translates into reduced fuel usage and carbon footprint, as well as reduced need for equipment and truck maintenance.

Lessons Learned

Proper training for grid operators and field crews is essential for the DA system to become an integral part of daily operations and maintenance. Quality training allows system operators to learn and fully utilize system functionality, enabling rapid and coordinated response to grid outages and disturbances.

Future Plans

El Paso Electric plans to continue to evaluate current manual distribution management processes relative to the costs and benefits associated with deployment of additional DA technologies.

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