Municipal Electric Authority of Georgia

MEAG Smart Grid Distribution Automation Project

Scope of Work

The Municipal Electric Authority of Georgia (MEAG) is a Generation and Transmission entity serving 49 MEAG Distribution "communities." The Smart Grid Investment Grant (SGIG) project upgraded 133 of 171 substations across the territory. The effort involved implementation of substation automation equipment and integrated information technology infrastructure, as well as remotely controlled motor-operated transmission switches within 11 key substations. As a result of this project, over 75% of MEAG's distribution substations have been enhanced by SGIG improvements.

At-a-Glance

Recipient: Municipal Electric Authority of Georgia

State: Georgia

NERC Region: SERC Reliability Corporation

Total Project Cost: $24,534,700

Total Federal Share: $12,267,350

Project Type: Electric Distribution Systems
Electric Transmission Systems

Equipment Installed

- Substation Automation Equipment for 133 out of 171 Substations
  - SCADA Communications Network
  - 284 Breaker Relays
  - 813 Regulator Control Panels
  - 64 Remote Terminal Units
  - 121 Routers
  - 96 Substation Smart Meters*
  - 21 Remote-Controlled Motor-Operated Switches
- Transmission Line Monitoring Equipment

**Substation smart meters installed at substations to meter local distribution companies*

Key Benefits

- Reduced Operating and Maintenance Costs
- Improved Electric Service Reliability

Objectives

The project's primary purposes were to improve system reliability, gain operating efficiencies, and enable standard platforms for distribution automation (DA) investments by the communities—48 cities and one county—to whom MEAG supplies bulk electric power. These communities, through their municipal utility systems, distribute electric power to residential, commercial, and industrial customers across the state of Georgia. The communications systems and automation equipment deployed within MEAG's distribution substations reduce the frequency of system failures and associated maintenance activities. Along with improving the reliability of the assets owned and operated by MEAG, the upgraded substations support future implementation of DA and advanced metering infrastructure (AMI) technologies by the communities it serves.

Deployed Smart Grid Technologies

- **Communications infrastructure and substation automation equipment:** The communications system includes distributed network protocol-based devices, including supervisory control and data acquisition (SCADA) remote terminal units, routers (with built-in firewalls), microprocessor-based relay units, regulator control panel units, and substation meters.
- **Transmission switches:** The project deployed remotely controlled motor-operated switches at 11 of the 133 high-priority substations. These switches enable faster restoration of transmission supply to distribution substations, further reducing operating costs and improving outage response time.

Benefits Realized

- **Reduced operating and maintenance costs:** Substation automation reduced the need for on-site technicians and maintenance. System instability and disturbances can be remotely detected, analyzed, and resolved. These improvements also extended the frequency of equipment testing (three-year cycle to six-year cycle).

Municipal Electric Authority of Georgia *(continued)*

- **Improved system reliability:** Substation automation has enabled faster response to outages and improved reliability of power. Additionally, MEAG engineers are now able to examine fault data through remote interrogation of event data rather than relying on modeled outcomes. As a result, engineers have more situational awareness and can make more effective decisions relative to electric distribution system impedance and relay settings.
- **Improved operational safety:** The microprocessor-based relays and related communications systems allow MEAG's customers to apply remote "Hot-Line Tags". This enables distribution lineman to perform their utility work on and around their energized facilities with alternate relay and reclosing settings to prevent breakers from reclosing after an inadvertent contact by a lineman during work activity. These alternate settings make the breaker more sensitive to tripping for safety reasons.

Lessons Learned

The project team conducted detailed assessments of each substation's unique operating and maintenance conditions and upgrade requirements. Once these assessments were completed, the project team customized the scope of the upgrade for each substation. By maintaining flexibility to respond to emerging issues in the assessment process and exercising good cost control, MEAG was able to upgrade 133 substations, a 4% increase over the planned 128 substations. Additionally, MEAG improved its internal workflow processes in various engineering and operations functions in support of the higher work volume required for the three-year SGIG effort.

Future Plans

MEAG intends to continue to deploy smart grid technology in those substations that were not affected by the SGIG grant and, moreover, will expand its remote access functionality. Additionally, for those MEAG communities that are planning to install DA and AMI applications for their retail customers, the SGIG project-related system enhancements and new technologies provide the infrastructure necessary to assist those communities. Future DA and AMI applications will provide tools for these communities to reduce peak demand and overall energy consumption, lower carbon emissions, provide better customer service, and improve system reliability.

Contact Information

Doug Lego
Transmission – Director of Operations
Municipal Electric Authority of Georgia
dlego@meagpower.org