

Navajo Tribal Utility Authority *Advanced Metering Infrastructure Project*

Scope of Work

The Navajo Tribal Utility Authority’s (NTUA’s) Advanced Metering Infrastructure (AMI) project deployed 40,001 residential smart meters, network infrastructure, and a meter data management system (MDMS) to monitor, analyze, and process the meter data. Existing (pre-project) back office systems were integrated with the new AMI system to enable improved customer service.

Objectives

The main project objective was to deploy and fully leverage the AMI system to reduce meter reading costs and improve operational efficiencies. The system was designed to better meet customer needs through enhanced customer service and system reliability. Through this project, NTUA laid the foundation for achieving long-term customer, operational, and environmental benefits, including future deployment of AMI to the natural gas and water utilities.

Deployed Smart Grid Technologies

- **Communications infrastructure:** The project deployed a 900-megahertz (MHz) radio network and selected a wireless public carrier to backhaul meter data from the 100 collectors on the network.
- **Advanced metering infrastructure:** NTUA deployed 40,001 residential smart meters (out of 50,000 electricity customers). Forty percent of the meters have automatic connect/disconnect functionality. Deployed infrastructure includes an AMI head-end system that collects and monitors network and meter data and sends it to the MDMS and other enterprise systems, including billing and outage management systems, which are integrated with the new AMI system.
- **Meter data management system:** A new MDMS processes and packages meter data, translating them into useful information for billing and system analysis.

Benefits Realized

- **Reduced operating and maintenance costs:** The AMI system has reduced meter reading costs by enabling automated readings. The project has resulted in other operational efficiencies as well. The communications system relays meter data to NTUA, where the new MDMS helps NTUA leverage the data to better manage peak demand, which results in reduced system-wide capacity needs and operations and maintenance costs. New tamper detection capabilities reduce losses from electricity theft or diversion.
- **Improved electric service reliability and power quality:** The AMI system allows for faster, more efficient outage detection and diagnosis, as well as reduced restoration times. Meter signals provide information to utility staff

At-A-Glance

Recipient: Navajo Tribal Utility Authority

State: Arizona, New Mexico, Utah

NERC Region: Western Electricity Coordinating Council

Total Project Cost: \$11,603,575

Total Federal Share: \$4,991,750

Project Type: Advanced Metering Infrastructure

Equipment

- 40,001 Smart Meters (16,000 Remote Connect/Disconnect Modules)
 - AMI Communications Systems
 - 900 MHz Radio Communications Network
 - Public Carrier Backhaul
 - Meter Data Management System
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Key Benefits

- Reduced Meter Reading Costs
 - Reduced Operating and Maintenance Costs
 - Improved Electric Service Reliability and Power Quality
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Navajo Tribal Utility Association *(continued)*

about field conditions, allowing for more informed decisions and better response times. In addition, the information provided by the MDMS enhances power quality monitoring.

- **Improved staff morale:** NTUA meter readers were retrained to upgrade their skills for meter installation and other higher-paying duties within the utility.
- **E-911:** Homes in distant reaches of the Reservation do not have street addresses, making it difficult for first responders to locate some residents during emergencies. For each AMI meter installed, NTUA collected global positioning system (GPS) coordinates, which were required for network optimization. This effort had the unforeseen benefit of providing first responders with locations of 911 callers. Referred to as “e-911,” this achievement is believed to be a first-of-a-kind benefit of the Smart Grid Investment Grant program.

Lessons Learned

- NTUA utilized its own personnel for construction and installation of meters. Installation costs were lower than estimated, which allowed for an additional 12,000 meters to be installed, a 43% increase from the original plan.
- The NTUA service territory covers 27,000 square miles, and detailed network planning was needed to effectively locate the minimum number of components required to ensure reliable service. Testing of various deployment methods for gatekeepers, collectors, and backhaul options allowed NTUA to optimize the AMI system for reliable performance and keep costs down.

Future Plans

NTUA is actively seeking funding to leverage the existing AMI network to deploy AMI gas and water meters. The utility also plans to integrate the new AMI system with the outage management system and explore distribution automation on high-priority circuits.

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