

Modesto Irrigation District

Smart Grid Deployment and Installation Project

Abstract

The Modesto Irrigation District's (MID) Smart Deployment and Installation project involves installation of smart meters, implementation of customer interface systems, and automation of distribution substations. The smart meter deployment covers the Mountain House Development, a single isolated area with 3,348 customer sites. The project includes a Web portal to enable the customers to monitor their electricity consumption and costs. The project aims to reduce peak demand, system-wide losses, outage duration, and frequency, while improving voltage control. The smart meters and Web portal allows MID to consider implementation of time-based rate programs in the future.

Smart Grid Features

Communications infrastructure includes utilizing a preexisting wireless neighborhood area network for the backhaul communication infrastructure. Smart meters equipped with wireless network cards connect into the communications infrastructure and transmit the data back to MID offices. The infrastructure provides two-way communication, facilitating a variety of smart meter functions and applications.

Advanced metering infrastructure (AMI) provides for several features in addition to automated meter reading, including remote connect/disconnect outage detection and reporting, power quality monitoring, and tamper detection. A head-end system collects the meter data where it is organized and utilized by a meter data analysis system. The meters offer a variety of benefits including reduced meter reading costs and improved outage notification for faster restoration times.

Advanced electricity service options include a customer Web portal for MID customers. The Web portal facilitates two-way information exchange between the customers and MID and enables the participating customers to better manage their electricity use and costs. The Web portal allows customers to monitor hourly, daily, weekly, or monthly electricity use and to view and pay their bills.

Distribution automation systems involve the deployment of automated feeder switches and automated capacitor banks. The automated devices improve the reliability of the distribution system, reduce operations and maintenance costs, and reduce the number of outages. MID has identified a test substation for a phase-one deployment. The results

At-A-Glance

Recipient: Modesto Irrigation District

State: California

NERC Region: Western Electricity Coordinating Council

Total Budget: \$2,986,298

Federal Share: \$1,493,149

Project Type: Integrated and/crosscutting systems

Equipment

- 3,348 Smart Meters
- AMI Communication Systems
 - Meter Communications Network
 - Backhaul Communications
- Meter Data Management System
- Customer Web Portal
- Distribution Automation Equipment for 45 out of 120 Circuits
 - Distribution Management System
 - Automated Distribution Circuit Switches
 - Automated Capacitors

Key Targeted Benefits

- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Improved Electric Service Reliability and Power Quality
- Reduced Costs from Line Losses
- Reduced Truck Fleet Fuel Usage
- Reduced Greenhouse Gas and Criteria Pollutant Emissions

Modesto Irrigation District *(continued)*

from the phase-one deployment are being used to determine the phase-two substations and to determine which system upgrades are to be included in phase two.

Distribution system energy efficiency improvements involve the deployment of automated capacitors and volt/volt ampere reactive (VAR) control for the purpose of improving power quality and reducing line losses. The volt/VAR controls and the automated capacitors help to maintain optimal voltage levels in the distribution system, thus reducing the line losses.

Timeline

Key Milestones	Target Dates
AMI asset deployment begins	Q4 2010
Distribution automation asset deployment begins	Q3 2010
AMI asset deployment ends	Q4 2011
Distribution automation asset deployment ends	Q1 2013

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