



Case Study

How a Combo Utility Benefits from AMI

Dothan Utilities, Dothan, Alabama

With both water and power customers to serve, the City of Dothan, Ala. needed an advanced metering infrastructure (AMI) solution that could work as well with 35,000 water meters located in pits as it did with 31,000 electric meters wired to homes. Dothan Utilities evaluated several types of AMI solutions and chose Aclara for its redundancy, cost-effectiveness and ability to integrate with its outage management solution.



“We had confidence in Aclara to handle our water and electric requirements because I worked with the company before, at a rural electric cooperative. I knew their technical support people would be there when we needed them.”

LARRY SMITH
Electrical Planner, City of Dothan

BUSINESS CHALLENGE

There are many reasons Dothan Utilities wanted to implement AMI, and most of them boiled down to delivering more responsive customer service to city residents.

Outage Restoration

Take outage restoration, for instance. This Alabama community sits in the path of both hurricanes and tornadoes, and power outages happen with some frequency. “We wanted to have a system that would tell us when the power is on or off,” says Chris Phillips, electric operations superintendent for the City of Dothan.

In 2018, Hurricane Michael left nearly 95% of the utility’s customers in the dark, he recalls. It took seven days to complete the restoration, a circumstance that contributed to the launch of a highly aggressive tree-trimming program to limit the damage future hurricanes could do by bringing down tree limbs on power lines.

That helped on the preventative end, but Dothan Utilities wanted to speed up the restoration end too. “The outages that cause the most trouble are the ones that remain after you’ve got the main fuses back,” says Phillips. Those smaller outages nested within the larger ones can leave customers in the dark long after the utility thinks service is back online, and they’re more costly to fix because, often, crews have already moved on and are nowhere nearby. With an AMI system in place, utility managers can verify service restoration before sending crews to the next location.

Customer Care

Dothan Utilities also looked to enhance its customer service for billing and payment. City managers wanted to show customers how much water and power they were using because customers who are more informed about their utility costs ends up managing their water and electric usage more effectively.



In addition, Dothan Utilities wanted to establish a prepayment program allowing their customers to take control of their consumption and payment balance to avoid disconnections. Standard utility accounts require customers to provide security deposits up front. In addition, between late payment fees and disconnection fees, customers would often find themselves stuck in a downward spiral of repeated disconnections, fees, and large monthly bills.

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CHRIS PHILLIPS

electric operations superintendent for the City of Dothan

To enable its prepayment program, Dothan Utilities needed an advanced AMI technology providing the data needed to report energy and water consumption of customers, as well as the balances in their prepaid accounts. Dothan Utilities’ pre-pay program offered a ray of light for many customers by eliminating up front deposits, preventing any bad surprises on their monthly



bills, and empowering them to track usage and make smaller, more frequent payments.

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Because Dothan Utilities pays an actual demand rate to its generation and transmission service provider, Alabama Municipal Electric Authority, the utility wanted the insight from voltage readings that AMI meters can deliver on all customer premises. Today, the utility uses voltage reduction on a few of the city’s 40 feeders to reduce substation voltage, thus reducing summer peaks and lowering the demand charge. However, it needed the insights provided by AMI data to add more lines to the program.

“All of our voltage regulation is in the substations,” says Phillips. “Without visibility into voltage on the system, Dothan Utilities can’t expand this energy- and cost-saving measure to help keep rates low for customers.”

SOLUTION OVERVIEW

Dothan Utilities implemented the Aclara RF™ network, a point-to-multipoint network that provides gas, electric and water utilities with reliable, two-way communications. The network employs licensed 450 MHz radio transmissions for all inbound and outbound communications between data collectors and endpoints.

Feeding into that network are Aclara’s I-210 residential electric meters, which deliver precision measurement as well as smart-grid functionality for voltage insight, load management, advanced billing options and more.

The AclaraONE® software platform manages the AMI system, allowing Dothan Utilities to have one head-end for both water and electric meter reading. Along with supporting meter-to-cash functions, AclaraONE delivers the broad set of functionalities utilities require to monitor, optimize and improve the operation of their infrastructures.

Using this software, network operators can react faster and more effectively while improving the technical and economical operation of their distribution grids. AclaraONE can leverage the Aclara RF network to provide communications and visibility to electric distribution devices, such as capacitor banks, reclosers, voltage regulators, customer meters and other intelligent electronic devices.

More redundancy, longer lasting, cost-effective

Dothan Utilities picked Aclara’s 450 MHz system because of the advantages lower frequency transmission delivers. Compared to a 900 MHz signal, a 450 MHz signal penetrates obstacles and propagates more effectively. In most cases, a 450 MHz signal will go four times as far as a 900 MHz signal using the same power level in the transmitter.

That makes the Aclara system a great choice for a combination utility that needs to serve both electric and water accounts because the meter reads can successfully transmit out of meter pits and basements as well as through other obstacles. In fact, Phillips said that even the area’s Alabama long-needle pine could interfere with 900 MHz signals but did not affect the 450 MHz signal used by the Aclara system

Another benefit of Aclara’s solution to Dothan is that its AMI modules for water meters, called meter transmission units, have a proven battery

life of 20 years, ensuring that water meters will continuously collect and send readings to utilities. Plus, the solution offers a distributed data collection approach that ensured Dothan Utilities would get 100% redundant coverage at a much more competitive rate than that of the other competitive system.

The other solution evaluated by Dothan Utilities required a much higher mounting elevation to get the network coverage needed. The Aclara network on the other hand uses distributed data collection units (DCUs) mounted on existing power poles and structures rather than specially built towers, which provides reliable communications.

“Aclara spent a lot of time with us in the field ... just rolled up their sleeves and jumped right in to solve problems. That’s what we want to see.”

LARRY SMITH
Dothan Utilities

While this approach necessitates more collectors, it also means each meter can be read by two or more collectors, which builds redundancy and resiliency into the system. In Dothan Utilities’ case, the cost of the towers and associated communications equipment exceeded the cost of the DCUs necessary to do the job.

To ensure the system worked as planned, city managers wanted to conduct a pilot. Aclara stepped up to the challenge, exceeding the 98.5% read rate mandated by the utility. The utility, in fact, often collected 100% of reads due to the redundancy built into the Aclara RF solution.

The pilot also allowed Aclara and Dothan Utilities staff to fine tune integrations with the utility’s outage management system and older, legacy billing system. That meant meters could immediately begin supporting meter-to-cash functions as well as outage restoration.

BUSINESS JUSTIFICATION

Prior to adopting AMI, the City of Dothan had an older drive-by automatic meter-reading system to cover electric accounts and used manual, walk-by reading for water meters. Right out of the box, AMI saves meter-reader time and expense. In addition, the system gives the utility:

An affordable way to read a complex service territory: Dothan Utilities has some 3,000 more water customers than electric customers, which means the two commodities serve customers in different areas. An alternative, competitive system Dothan Utilities was looking at would have been cost-prohibitive to serve those outlying meters because it used just a few towers for data collection devices. With Aclara, the utility had to add a few more DCUs for the water-only customers, but the solution was still reasonably priced.

More efficient outage restoration: “Now that we’ve tied the Aclara system through the interface available in AclaraONE into our Milsoft® outage management system, we see outage information automatically,” says Phillips. The more meters reporting, the more information the OMS system has to pinpoint the device on the distribution system that needs repair, allowing crews to find the problem more quickly.

Once it’s restored service, the utility can ping meters and verify that service has been restored at all customer premises, and there are no remaining nested outages. Nested outages may be due to issues like defective transformers, which may only affect a handful of homes. These power outages often remain unresolved because they’re hidden within a more substantial outage, and crews miss them after they’ve restored service to a larger area.

By catching those outages due to a secondary service loss before crews move on to another trouble spot, Dothan Utilities improves reliability indices and delivers better, faster restoration service to customers. “It keeps us from having to run men back and forth to different locations,” Phillips says.

Proactive maintenance and outage prevention:

Dothan Utilities' managers intend to leverage AMI data in their engineering analysis system. "We'll have load data on every single customer," says Phillips. "We'll be able to find areas where our transformers are oversized or undersized and resolve issues before they become problems." He adds that the utility also will evaluate protective devices to ensure they're adequately sized as well.

Lower wholesale power costs: Pushing power out of substations at lower voltages reduces energy costs for the utility – because there's less energy being used – and cuts down on summer peaks, which impacts the wholesale rates the utility pays year-round and therefore keeps the rates low. Dothan Utilities already performs voltage reduction on some feeders, and the city plans to expand the program.

Phillips estimates that using voltage reduction supported with AMI insights will save the city some \$20,000 per line on its summer power bill. Add in the lower demand ratchet, and he sees the utility saving as much as \$2 million annually on its wholesale power costs. These savings will translate into lower rates for city residents.

Lower operational costs: "We have a lot of rental property in the city ... people moving in and out all the time," says Smith. He estimates that between the move-in/move-out traffic and no-pay disconnections, the utility must roll approximately 75 trucks per day, Monday through Friday. Each truck roll costs close to \$150 during the week and \$450 after hours, which happens a handful of times every week. By eliminating most of those truck rolls, the utility can save some \$2.8 million or more each year.

A way to help citizens on tight budgets:

Customers who have a difficult time paying the upfront costs associated with electric and water service now have an alternative: pre-paid

electricity, water, sewer services, and trash collection. Through the new pre-pay system, Dothan Utilities residents can divide monthly expenses into more manageable payments and avoid the inconvenience of service disconnection.

"By using AMI data from the Aclara AMI communication network and software in Milsoft, we can confirm that we have an area restored during an extensive outage before we leave and move resources to the next trouble location. It makes a big difference in a big storm."

CHRIS PHILLIPS
Electric Operations Superintendent, City of Dothan

A system that utility staff could manage more easily: When Smith realized what the configuration of the alternative solution was – the one with just a few large towers and collection units – he became concerned that it wasn't necessarily something he could repair himself or get repaired quickly. "We're trying to run a pre-pay system, and we have to wait for that vendor to fly in somebody to work on the one or two collectors we have in the city? That's not going to work for us."