



CITY OF DUBUQUE WATER DEPARTMENT

CLIENT

DUBUQUE, IOWA

LOCATION



HIGHLIGHTS

- Number of services: 22,500
 - 22,386 residential
 - 114 C&I
- Realized annual cost savings of \$145,000 with ability to read its own meters vs. outsourcing
- Achieved 99% meter read success rate with four fewer collectors than originally planned
- Identified 1,844 accounts with continuous leaks and 3,499 with intermittent leaks
- Increased customer service with daily and hourly consumption monitoring
- Decreased water pumpage by 0.62% yet consumption revenue increased by 5.9%

An Amazing Economic Recovery: Recovering Lost Revenue with ARB® FixedBase™ AMI

Old Remotes and Pads Had Lost their Touch – as well as Revenue

Named for its first permanent settler, French-Canadian fur trader Julien Dubuque, Dubuque is Iowa's oldest city. Now known as the "Masterpiece on the Mississippi", what began as a lead-mining and fur-trading center, became a major manufacturing hub; and today stands as the major retail, medical, education, and employment center for the area where Iowa, Wisconsin, and Illinois meet.

Unlike much of the rest of Iowa, the ninth-largest city in the state has varied topography – rolling hills, valleys, and steep bluffs that overlook the Mississippi River. Serving a population of 57,637 with approximately 22,500 water meters (22,386 residential, 114 commercial and industrial), the City of Dubuque Water Department had last undergone a system-wide changeout during the early 1980s. In its aging system, more than 40 percent of its meters were 25 years old or older; the technology to read these meters was nearly as outdated. The City contracted with the local natural gas utility to send out meter readers to walk routes, collecting data with a blend of old pulse generator remotes and touchpads.

Deciding in 2007 the time was right to move away from a "patchwork process", with direction from City Manager Michael C. Van Milligen, Finance Director Ken TeKippe, and Water Department Manager Bob Green, the City of Dubuque Water Department retained an engineering consulting firm to evaluate whether new technology was warranted. In 2008, another firm performed test studies on samples of the City's meters. A test sample of 150 meters more than five years old showed that 35 percent of small meters (from 5/8 to 1 inch) and 40 percent of large meters (1 1/2 to 8 inches) were inaccurate. To test whether accuracy was more than just a function of age, another sampling of 150 existing meters that were five years old or newer revealed that 15 percent of the small meters and 10 percent of the large meters were also inaccurate. In addition, testing showed that more than six percent of annual water consumption was not recorded, resulting in thousands in lost revenue every year.

Bringing in Neptune to Fix on a Solution

With these results, Green and his team began researching options for a new meter reading and billing system. After evaluating handheld probe technology, telephone technology, mobile radio technologies, and other methods, the City's Finance, Information Services, and Water Departments found that a two-way communication fixed network system would be needed to meet its requirements. Such an AMI (advanced metering infrastructure) system could not only help recover lost revenue but also provide useful information for both the City and its water customers. "We wanted to provide a user-friendly tool for our people in customer service as well as the customers we serve," Green said.

The City issued a request for proposal to manufacturers of different AMI systems and reviewed the bid finalists with an eye for quality, cost, and availability. In the end, Green and the City's interview team chose Neptune's ARB® FixedBase™ AMI System, working with Territory Manager Ian Coburn as well as a Neptune Level One Distributor, Ferguson Water Works. The project management team, headed by Ferguson's Meter Division Manager, Kim Foster, began work in early 2010.

Ferguson notified customers of the changeout through a comprehensive awareness campaign that included mailings, public service announcements on local cable television, door hangers, and call centers. Residents and business owners could schedule individual appointments online or by phone to have the E-Coder® Solid State Absolute Encoder register and R450™ meter interface unit (MIU) installed at their convenience.

According to Coburn, the area's physical landscape is ideally suited to the installation of Neptune's 450MHz AMI system. Flexible collector deployment options and the high power 450MHz transceivers enable the system to avoid RF nulls that would be problematic for other systems. The collectors were placed atop water towers, city buildings, cell phone towers, and schools. Not only did the result produce a 99 percent read success rate, but it was achieved with four fewer collectors than originally called for in the Water Department's propagation study. What's more, the backhaul communication from the water towers was integrated into the City's existing police/fire communications infrastructure to transmit data which brought additional reductions in the anticipated life cycle costs of the system.

Capturing Low Flows While Improving Cash Flows

From the very beginning, the ARB FixedBase AMI System saved the City money. Since it no longer had to contract with the natural gas utility to collect data, the City realized an annual cost savings of \$145,000. With the switch to fixed network meter reading, Dubuque also achieved milestones in its "Sustainable Dubuque" initiative, reducing emissions and carbon footprint by taking trucks off the streets. In addition, while the old meters had been read once a month, the new meters transmit readings every day.

With daily and hourly consumption monitoring, water conservation and customer service go hand in hand for the Water Department. High resolution data allows Green and his team to watch for continuous usage by customers – not just for leaks – spotting possible consumption from low-flow demand applications such as timed ice makers, scheduled irrigation systems, and automatic humidifiers. The goal, he said, is "to capture revenue from low-flow usage whereas before, water was used in amounts too small to show up in readings".

By the time installation was 95 percent complete, water pumpage was down for the year by 0.62 percent yet consumption revenue was up 5.9 percent – 81 million gallons of water – representing an untapped \$306,000 of income. This showed Green that he is "picking up low flow that hadn't been identified in previous years". In fact, the additional revenue is exactly in line with initial projections established before the project, between five and seven percent.

The AMI system's flags for continuous usage have proven invaluable to the City as well. Green said, "Keeping in mind the national average of 30 percent of homes in a typical system having leaks, we've been able to identify 1,844 accounts with continuous leaks and another 3,499 with intermittent leaks... that tells me we have more than 5,000 accounts with revenue on wasted water that probably wasn't being captured before. It all adds up, of course."

A Water Department that Gives Power to the Customer

Now, when a customer receives a bill that's higher than in the past, customer support personnel can explain that the newer meters are simply picking up lower flows that hadn't been measured before. Customers are learning to better monitor the water they use while the City helps to point out possible leaks when they occur – for instance, when a toilet in an unused downstairs bathroom continues to run – so that the alerted homeowner can fix the problem and lower his or her next water bill. The City even has an ongoing grant program in place to assist those customers who've had leaks identified, reimbursing them for 50 percent of the cost of repairs up to \$100.

The ability of Neptune's ARB N_SIGHT AMI software to track and graph consumption also supports the City of Dubuque's Smarter Water Pilot Study, a year-long study of volunteer households conducted in partnership with IBM Research. Through this program, the City hopes to show customers how to monitor their own usage and see how it affects their bills, allowing them to adjust their usage to reduce those bills, as well as their overall carbon footprints, if they so choose.

Speaking to the GIS database that Dubuque now uses as part of its AMI system, Green said, "Here's a program in which we can put fresh information into an excellent historic database for both the customer service and water distribution departments." For example, customer service can readily access MIU locations and before-and-after photos of installation sites. The GIS is also a useful tool for distribution personnel who can identify water pressure levels within the City's five geographically-divided pressure zones.

As of August 2011, installation is 98 percent complete. "Now we have a fresh start knowing that all meters are new and calibrated; and we're also starting fresh with the billing cycle, auditing product use, and educating the public about water consumption," said Green. "It's just a good feeling knowing [we're] able to do all that. Now we have realistic facts and not fiction to work with."

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