Kennebec, Maine Water District Goes Wireless and Lead-Free with Fixed-Base Network and Composite Smart Water Meters

Case Study

Maine's Kennebec Water District (KWD), founded in 1899, has the unique distinction of being the first water district formed in the country. In the 1980's, KWD became one of the first water utilities to introduce automated meter reading technology to its customers using the Sensus TouchRead® system. More recently, Kennebec upgraded to a fully automated meter reading system that wirelessly transmits data from the meter to KWD's centralized database.

KWD supplies water for domestic, commercial and fire protection purposes to a population of more than 22,500, including some 7,800 residential and almost 1,000 commercial customers. Demand for water in the Kennebec district averages 1.2 billion gallons per year and is fed by China Lake, which covers a surface area of more than six square miles.

CHALLENGE

Water district personnel knew that the processes inherent to manual meter reading were labor intensive and inefficient, requiring periodic trips to the physical location of each meter. Data was obtained via a handheld computer from the meter's touchpad, typically located on the exterior of the structure. Additionally, KWD officials sought a water management solution that was intelligent, efficient and compliant with new materials standards.

SOLUTION

KWD partnered with Sensus and pipeline specialists Everett J. Prescott, Inc. on a three-year project to install a fixed-base, advanced metering infrastructure (AMI) system to drive efficiency through two- way communications.KWD also began replacing existing bronze-body meters with zero lead Sensus iPERL™ meters, which are constructed using composite materials and are fully compliant with regulatory standards. KWD anticipates that SmartPoint™ transmitters will be installed on all existing meters by 2013 and that the transition to all iPERL meters will be completed over a ten-year period.

The iPERL meters have distinct technological advantages over traditional bronze meters. First, there are no moving parts, making the meters more accurate and reliable. They are also more sensitive to flow changes and less susceptible to temperature impacts. Overall, they offer greater lifetime accuracy and regulatory compliance.

In addition, iPERL meters provide two-way communications via the Sensus FlexNet™ network. The AMI system communicates with SmartPoint radio transceivers that are installed over external touchpads on meters. The system collects and then transmits water usage data to a central processing unit in the KWD business office multiple times per day, eliminating the need for a person to physically obtain meter readings. Collected data includes consumption, diagnostic and status measurements.

KWD began evaluating technologies for automated reads about four years ago, explains Jeff LaCasse, general manager. "We initially looked at some of the drive -by 'radio-read' systems that are being used by some large water utilities, but those systems still required people to drive in relative close proximity to each metered structure and collect the data on a laptop computer using a radio signal," he said.

"The Sensus FlexNet system gives us a faster, easier way to collect more data and it automatically delivers the information to our KWD database. Also, the network can support our entire territory with only three transmitter units, helping to control system costs," said LaCasse.

Within nine months, two base station collectors and more than 3,000 endpoint transmitters were installed. The third base station is slated to be operating in 2012.

RESULTS

KWD began to see customer service improvements and operational efficiencies immediately as daily meter reads began on existing meters equipped with fixed-base network endpoints. Instead of quarterly monitoring via manual meter reads and assessments, each FlexNet unit transmits meter data multiple times per day into the KWD computer system, which is programmed to automatically issue a "red flag" alert if water usage is high or out of the ordinary. Through automated visibility into potential problems, KWD can identify leaks, backflow problems or potential meter tampering and help customers alleviate wasted water, excessive charges and possible property damage.

In one instance, explains Mike O'Brien, KWD customer service manager, a customer suddenly had an excessive amount of water being used in his home. "Before the AMI system we would not have known what was happening," said O'Brien, "but with the system we were alerted to abnormal hourly usage data and the customer had what turned out to be a leaky toilet resulting in the loss of hundreds of cubic feet of water."

On the operations side, the AMI system has reduced transportation and manpower needs. "Removing the vehicles required to support manual meter reads will help pay for the system," said LaCasse, "in addition, although we will no longer be required to fill the meter reader position, by using retirement attrition we will be able to move the current meter reader into a different position."

KWD can now resolve service tasks, such as meter readings necessary for property transfers or resident changes, from its home office rather than through a time-consuming site visit.

The AMI system also has a positive impact on a number of areas beyond customer service and operations. For instance, eliminating the need for a meter-reading fleet greatly reduces KWD's fuel usage and carbon footprint. From a risk management perspective, the AMI system effectively eliminates safety hazards inherent with physical meter reading, which carries a high risk for injury.

CUSTOMER RESPONSE

Overall public response has been positive in part because KWD officials thoroughly communicated the project steps and benefits with its customers. They also addressed privacy issues by explaining that the Sensus' network only collects water consumption data and transmits the data directly from each endpoint to the KWD database. The majority of the time the AMI system is idle, "asleep," until the KWD computer initiates a reading, which routinely occurs four times daily for a very short period of time. The transmission of data from each endpoint to the KWD database takes milliseconds, literally 0.04 seconds – a virtual blink of the eye.

KWD provides customers the option to continue with manual reads rather than transitioning to the new system. However, of the more than 3,000 installation sites to date, only seven end users have elected to "opt out," a shining testament to customer approval of the new and improved system.

CONCLUSION

Replacing quarterly manual meter reads with daily automated meter reads positions Kennebec Water District to be a more effective steward of resources and end-user consumption. Adopting iPERL meters furthers the amount of intelligence gathered by the network and helps KWD meet expected regulatory requirements about materials used in meter construction.

For more than a century, KWD has implemented proactive measures to ensure the highest possible service to its customers and to manage its operations professionally and efficiently. The transition to a two-way communication network enables the efficient and timely gathering of water usage data and will provide meaningful insights into opportunities for future improvements by this historic organization.

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