

# METER READING

By John Hengesh

# AMR • An Asset • Comes of Age

**L**ife at a water utility or municipality is gaining complexity. With the cost of merely doing business rising, the supply of water shrinking, a growing customer base demanding better service, an aging infrastructure and competition a factor that can no longer be ignored, it is no wonder those in charge of the nation's water systems are looking for answers.

The situation leaves utilities and municipalities with three primary choices.

- Do nothing and let operational challenges progress to a virtually unmanageable level while denying customers the service and reliability they deserve.
- Try to improve operations with existing resources that are in many cases already stretched thin.
- Embrace an innovative, proven technology that improves operational efficiency, reduces costs and increases customer satisfaction.

Automatic meter reading (AMR) is a technology that falls into the final category. Its use is popping up in towns and cities all over the country as water utilities and municipalities identify it as a solution to a host of challenges.

## Speed Reading

At a basic level, AMR technology enables accurate and timely meter reading with unprecedented efficiency. This is accomplished through the installation of a radio-based meter module called an ERT module on a new or existing water meter. Readings are then collected by a meter

reader using a handheld or vehicle-based radio device, or by a fixed network system.

No matter what collection method is used, AMR is exponentially faster and more efficient than the old method of manually reading each meter. For example, a meter reader using a handheld computer and walking a route can typically read up to 300 meters during an eight-hour shift. In contrast, a single meter reader equipped with a vehicle-based mobile computer can read up to 15,000 meters during an eight-hour shift.

Such huge efficiency gains lead to immediate and lasting cost savings. Denver Water, currently installing ERT modules on 220,000 meters, is a good

example. "We just figured out that the way we were doing it, with all of the trucks and the people and the equipment, was too expensive," said Bob Blauvelt, Denver Water's customer services field manager.

As the project progresses, the utility's fleet of 33 meter readers, all in separate vehicles, will be reduced to a lone meter reader in a single vehicle. The cost savings from that change alone are significant. In addition, Denver Water anticipates no layoffs, as its workforce will contract through normal attrition.

Obtaining readings without setting foot on a customer's property has a benefit with both human and financial rewards: safety. Climbing over fences, slipping on



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ice and snow, and confronting aggressive and potentially dangerous dogs are just a few of the hazards of meter reading. The process of manually reading a pit-set water meter is not the safest endeavor either, as meter pits have been known to contain spiders, water moccasins and other unsavory creatures. Beyond the fact that no one likes to see a worker injured, the costs of dealing with such inherent dangers, from liability insurance to disability benefits to replacement workers, can be enormous.

### Customers Rule

In much the same way it does for meter readers, an AMR system gives customers an added measure of safety. Authorities receive frequent reports of criminals gaining entry to homes by posing as meter readers and claiming the need to inspect an indoor meter. If a utility does not do everything possible to eliminate dangers to its customers, it can face a high degree of liability. An AMR system means meter readers no longer need to enter customers' homes.

Safety is only one way in which timely and accurate metering data can improve the relationship between a water utility or

municipality and its customers, not to mention strengthen the bottom line.

Reducing the number of estimated reads is another immediate benefit of automation. The city of Philadelphia estimated in 1998 that about 20 percent, or 100,000 of its customers had not had their meters read for more than a year. This results in the need to estimate the reading until an actual reading can be obtained. The downside of estimated reads is customers hate getting bills based solely on an educated guess, and the utility, in many cases, under-bills the customers.

### Plugging the Drain

Older, slow-running meters represent another revenue drain for water utilities. For instance, independent testing conducted by a Minneapolis-based testing firm, discovered that the city of Mankato, Minn., was collecting an average of only 83 cents for every dollar worth of water used by its residents due to slow-running meters. AMR installation offered the perfect opportunity to fix the leak in its revenue cycle caused by inaccurate meters. Mankato combined its AMR installation

with a meter changeout program to replace its older, slower-running meters with new Badger water meters equipped with Itron ERT meter modules. Today, with both AMR technology and new meters installed, the city of Mankato and its customers can proceed with confidence that their meter reads and billing are accurate.

Additionally, the cost of estimated meter reads ripples throughout the utility's revenue cycle. Bills based on estimated reads create unhappy customers who call to complain, thus increasing call center traffic and the associated costs. Prior to the installation of its AMR system, the Philadelphia Water Department received over 175,000 calls related to billing issues in a year. With the AMR system installed and operational, that number has been reduced by more than 20 percent, while the call abandonment rate has been reduced from over 30 percent to less than 10 percent. Billing adjustments are an additional expense attributed to estimated reads.

One of the main reasons cited by utilities of all sizes for switching to an AMR system is the ability to shorten the read cycle and, therefore, the billing cycle. This is a positive step for all sides. Customers who receive an accurate bill on a regular, frequent schedule are more likely to pay quickly and, if not merrily, at least without complaint. Though it represents the same cumulative amount, a \$20 monthly bill is much easier for a consumer to stomach than a \$60 bill every three months. A more timely and accurate bill, based not on estimated reads but hard data, puts money in a utility's pocket through revenue certainty, as well as the lowering of costs associated with collections and complaints to call centers.

### Staying Ahead of the Curve

Keeping customers happy is part of a new reality in the water industry. Exploding growth, water shortages, privatization, globalization and consolidation are trends that are here to stay. AMR technology is crucial to meeting these new challenges.

The City of Peoria, Ariz., has peered into its future and has studied issues that must be addressed. Its population is projected to double within the next 10 years, and the supply of water to western states is tenuous. If the city insisted on doing busi-



Automatic meter reading technology enables accurate and timely meter reading without the need to enter customers' homes.

ness the same as it always has, its water staff would double along with the population. However, with an AMR system in place, meter readers will be taken out of the field and put to work in maintenance and customer service. Staffing levels will remain stable despite an additional 100,000 customers. In addition, customers will actually receive better service because that is where the city will be able to concentrate its resources. "The customer service ramifications of AMR are huge for us," Larry Dobrosky, revenue manager for City of Peoria Water said.

Dobrosky also understands that water is a finite resource, and that utilities and municipalities like his cannot keep watching their business literally go down the drain. Western states have had a firsthand look at the energy crisis in California, which is due partly to a lack of supply. As droughts persist and population growth continues, the supply of water grows shorter as well. Therefore, allowing water leaks and irresponsible usage to go unchecked is self-evident in its carelessness. These factors cannot be addressed when there is no information to go on, when a meter is read once every 3 months, once a year or, in a few cases, not at all.

An AMR system enables a utility to stay apprised of where water actually is going. When data shows that a certain area, or even an individual customer, appears to be using too much, the utility can send a crew to find out exactly what is going on. At the scene, a crew can either fix a costly leak or the utility can take steps to lessen excessive usage, either by education, conservation incentives or regulation.

"We have to be proactive. It used to take about 30 days from the time leaks or abnormal usage were reported to when we were able to address the problem," Dobrosky said. "With more people freed up for maintenance and the constant availability of information, we'll now be able to fix the problem in a day or two."

Studies also show that customers who know their consumption is closely metered actually use less water.

Another trend, the consolidation and privatization of the water industry, is shifting the way utilities and municipalities think about their customers and their business. In the competition-free environment of the

### Key Benefits of AMR for Water Utilities/Municipalities

- Reductions in meter readers and associated expenses
- Elimination of estimated reads
- Reduced call center traffic
- Improved employee and customer safety
- Increased customer satisfaction
- Enhanced leak identification
- Improved data for infrastructure build-out or replacements
- Increased knowledge to empower conservation measures
- Improved cash flow
- Shortened billing cycle

past, water utilities often took customers for granted. However, with large investor-owned water utilities taking an increasing stake in the industry, a utility or municipality that wishes to maintain its competitive viability as well as its independence must focus on making its operation as strong as possible. That means improving operational efficiency, serving customers better than before and decreasing costs.

AMR technology meets each of these challenges head on. Conversely, if a municipality wants its water services to become privatized in order to free up public resources for other uses, it would do well to implement a system that makes it more attractive to potential suitors. Streamlining metering practices and ensuring steady cash flow also can go a long way toward satisfying governmental entities that have a hand in merger approval or regulatory oversight. Political considerations can never be ignored.

### A Glove-Like Fit

Water AMR technology allows for a tremendous degree of flexibility in implementation, deployment and utilization. For virtually any type of water utility (large or small, rural or urban) there are benefits to be derived from an AMR system.

An AMR system can be put in place gradually depending on the utility's situa-

tion. It sometimes makes sense to first install ERTs on hard-to-read meters so that the utility and its crews can get used to the capabilities of the technology and gauge future needs. If the utility deems it necessary to upgrade to a handheld, vehicle-based or fixed-network AMR system, in phases or all at once, the process is easy to accomplish because all of the equipment is compatible.

Smaller utilities and municipalities find that AMR technology can grow easily with them. Larger utilities, with a lot of area to cover, appreciate the ability to upgrade in phases as more ERTs are installed on metered properties. A good AMR system should fit any stage of a utility's development and adjust to changing metering needs.

Utilities often find that the cost savings associated with an AMR system are so immediate that the implementation practically pays for itself. Today, a wide variety of flexible financing systems (ranging from outright and turnkey purchases to synthetic leases and outsourcing operations and maintenance of the system) put AMR technology well within any utility's or municipality's budget.

AMR technology continues to evolve. The most recent step is the introduction of a dual-mode ERT module for harsh, pit-set environments. A regular ERT module operates in "wake-up" mode, awaiting a radio signal from a reading device, after which it transmits metering data to a collection system. In addition to wake-up mode, the new dual-mode ERT module can operate in "bubble-up" mode, in which no wake-up signal is required. Instead, the ERT sends a continuous stream of data that can be picked up by most collection systems.

The public water utility in Houston, Texas, recently tested a dual-mode ERT, and officials came away impressed. "We liked it because if there was radio interference in waking up the unit, we had the flexibility to go to bubble-up mode," said Larry Paquet, deputy assistant director for City of Houston Water. "It's just another option, and that's great for us to have."

Another benefit of a dual mode ERT is that when operated in bubble-up mode,

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no FCC license is required due to the one-way communication process in an unlicensed radio frequency band. This is one less barrier and headache for many smaller utilities and municipalities that do not have the resources available to obtain FCC approval.

Water meter compatibility is simply not an issue anymore. This is an important development since many utilities use different brands of meters scattered throughout their customer base. A high quality AMR system includes endpoint devices or meter modules that fit all major meter types. Likewise, the durability and staying power of AMR systems, always a strength, continues to improve. Battery life now equals the life expectancy of most meters, meaning batteries can be conveniently replaced during normal meter changeouts. Unlike many new technologies that promise a revolution and deliver far less, AMR technology has already been proven effective in some of the largest cities in the country and some of the smallest municipalities as well.

Unfortunately, the nation's water infrastructure is showing its age. A projected \$138 billion will be needed to replace existing water pipelines. An AMR system can be a vital component of a progressive water system overhaul. It makes little sense to "modernize" infrastructure on a massive scale without taking advantage of the latest, most cost-effective technology in the process. Rather than spend millions of dollars to achieve a solution offering bare minimum functionality, utilities and government entities should see impending infrastructure revitalization for what it is: an opportunity to put hardware and information together in a comprehensive way, and in so doing establish a foundation for the future of the water industry.

In one sense, that is what AMR technology embodies. It is the future. However, to the benefit of water utilities and municipalities, it also is the present.

**About the Author:**

John Hengesh is vice president and general manager of the Water and Public Power Business Unit at Itron, Inc., in Spokane, Wash. He can be contacted at [john.hengesh@itron.com](mailto:john.hengesh@itron.com)

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